Healthy People 2010

Health Objectives for the Year 2010
for Lincoln & Lancaster County
Nebraska

Published by the Lincoln–Lancaster County
Health Department

The Lincoln–Lancaster County Board of Health wishes to thank
the Healthy People 2010 Community Steering Committee,
the Health Disparities Advisory Group, focus group participants and
all the individual community contributors for their invaluable dedication and
commitment to this project. The print document was published by
the Lincoln–Lancaster County Health Department, January 2000.
First electronic edition, January 2000.

Any inquiries may be directed to:
LLCHD | 3140 'N' Street | Lincoln, NE | 68510 | 402-441-8000
kcook@ci.lincoln.ne.us
csteinweis@ci.lincoln.ne.us

Contents

Preface

Healthy People is a national, state, and local prevention initiative that identifies ten year goals and opportunities to improve the health status of our people. Healthy People 2010 is the second comprehensive, community health goal-setting project conducted for Lincoln and Lancaster County.

In Lancaster County, and at the national level, Healthy People 2010 builds on strategies and lessons learned during previous decades. The first national health targets were published in 1979 in *Healthy People: the Surgeon General's Report on Health Promotion and Disease Prevention*. This set challenging goals: to reduce mortality among four different age groups – infants, children, adolescents and young adults, and adults – and to increase independence among older adults. These goals were supported by objectives with 1990 targets designed to drive action.

Healthy People 2000 expanded upon the first Surgeon General's report, seeking to create a strategic public health improvement approach helpful to local communities and health departments, as well as to federal and state governments. The three overarching goals of Healthy People 2000 were to increase years of healthy life, reduce disparities in health among different population groups, and achieve access to preventive health services. The national model for Healthy People 2000 objectives was replicated widely across the U.S. at the state level and in many localities, among them Lincoln and Lancaster County.

In January 1990, the Lincoln–Lancaster County Board of Health released *Healthy People 2000, Health Objectives for the Year 2000 for Lincoln and Lancaster County*. This document mirrored the framework of the federal level with one major exception: Lincoln and Lancaster County objectives included indicators for all areas of the environment affecting residents of the community.

The Board of Health and Health Department learned a number of very important lessons in the past decade while trying to promote the community's achievement of the Healthy People 2000 objectives. Some of these include:

1. A more dynamic and ongoing process is needed – one which responds and adjusts to changes in community needs and priorities, changes in the composition of the population, and changes in the health care system.
2. Sufficient resources must be allocated to assure that accurate, consistent data collection occurs. Many of the objectives established for the Year 2000 remained unmeasurable and therefore untrackable by the end of the decade, due to insufficient resources in this key infrastructure area.

3. Objectives must reflect the needs and will of the community to attract the community attention and effort needed to achieve them. Achieving even one of the target objectives involves community-wide planning, resources and effort.
4. Setting different targets for racial and ethnic minorities and other special populations in the hopes of achieving a narrowing of the gap in health disparities was not overly successful. A new and stronger emphasis on persistent health disparities is needed.

In light of the above, the process for Healthy People 2010 was designed with these lessons in mind.

Overarching Goals

The Board of Health and Community Steering Committee adopted two overall goals for Healthy People 2010: to eliminate health disparities and to increase the quality and years of healthy life for all residents of Lancaster County. These echo the national goals for 2010. Strong community participation and involvement was solicited at preliminary planning stages and throughout the Healthy People 2010 process.

More than four hundred individuals participated in various activities to define key issues, identify indicators and set target objectives for the year 2010. Measures were then refined, data collected, and a reporting strategy implemented which seeks to maximize community awareness and involvement over the coming decade. As work groups established objectives for each topic area and outlined key issues, they also identified relevant health disparities, infrastructure needs and recommendations for ways to make progress toward objectives, including the elimination of disparities, a reality.

Community Process

The development of objectives for Healthy People 2010 was designed to obtain broad community input. A Healthy People 2010 Community Steering Committee was established to help the Lincoln–Lancaster County Board of Health set direction and overall goals. The Community Steering Committee brings together community leaders interested in and knowledgeable about personal and community health, business, education, economic development, and environmental issues and concerns. Members include representatives from Community Health Partners, health care providers, Human Services Federation, Nebraska Department of Health and Human Services, Lincoln Public Schools, University of Nebraska, local business, Public Works, Natural Resource Districts, Nebraska Department of Environmental Quality, Hispanic Center, Malone Center, Asian Center, Indian Center, Catholic Social Services (refugee resettlement) and other representatives of racial and ethnic populations in the community. This very diverse group met to help establish the overall direction for the Healthy People 2010 process, to review and approve the plan for

community involvement and to review and comment on the initial drafts of the document.

The plan for community involvement was developed by topic area. Health Department staff responsible for each topic area identified key stakeholders. They also developed and implemented a process that obtained advice, recommendations, and input regarding issues, concerns and setting target objectives to reach by the year 2010. The goal was to identify *community* health objectives for the year 2010, not just objectives for the Lincoln–Lancaster County Board of Health and Health Department. At the end of this document, the Authors and Community Contributors chapter recognizes all the community members who assisted with this process.

An ambitious plan was developed to obtain input from the racial and ethnic minority communities. Given the overarching goal of eliminating disparities associated with race and ethnicity, it was critical to find a way to hear from these communities. Three feedback sessions were scheduled for minority community leaders. Information regarding different topic areas was presented and the discussion recorded and shared with all the work groups developing objectives. Nearly thirty community leaders attended and provided advice and recommendations regarding objectives, indicators and issues.

In order to obtain a broader range of information, focus groups were organized at each of the community centers (Asian, Hispanic, Indian and Malone). At the focus groups for the Asian and Hispanic communities, interpreters were present. In addition, two focus groups were held with people with disabilities. Over one hundred individuals participated in the focus groups. Summaries of all the information collected through the above means were shared with all work groups and are summarized in the chapter, Health Disparities.

Maintaining a Dynamic Process

Healthy People 2010 for Lancaster County has been designed as a ten year, dynamic community process, for which this document (published in January 2000) marks an important beginning. Bringing together stakeholders and setting objectives to achieve by the year 2010 was the first step. Actually achieving these targets and improving the health status for all residents of Lancaster County will require on-going cooperation, collaboration, creative partnerships and commitment from all sectors of the community.

Work is still needed to develop strong mechanisms for: (1) planning and sustaining community initiatives to achieve target objectives, (2) ongoing community monitoring of progress toward achieving objectives, and (3) data collection and maintenance of community health status information so that ongoing monitoring and planning can occur.

As a part of these processes, work is also needed to develop a clearer community vision concerning the connection between health

and the broader social and economic fabric of the community. How does community health status, health behavior, and a healthy environment relate to "quality of life" and visa-versa? What "upstream" causes need to be addressed in order to achieve our goals for a healthy community? Additional issue identification and objectives development is needed for Healthy People 2010 to effectively address these and similar questions.

Reporting and Assessment Infrastructure

To support this on-going effort, it will be necessary to routinely collect, analyze and report data about the health status of residents of Lancaster County. Routine monitoring of progress toward meeting the Healthy People 2010 objectives is a critical element for success. To increase access to the information, *Healthy People 2010* will also be released on the city's web site on January 28, 2000 (http://interlinc.ci.lincoln.ne.us/city/health/index.htm). During the next year, the Health Department will update the Healthy People 2010 report as new information becomes available.

Updates anticipated in 2000

- During the development of Year 2010 Objectives for Lincoln and Lancaster County, data on Nebraska objectives for the year 2010 was not available. The state will complete their planning process sometime in 2000. When that information is available, the tables displaying current data and objective comparisons will be updated.
- Updated data will be available from the 2000 Minority Behavior Risk Survey and the 2000 Adult Behavior Risk Survey, as well as Vital Statistics, Injury Surveillance, Youth Risk Behavior Survey and numerous other datasets on which new data is collected on a periodic basis. When analyses are completed, relevant data tables will be updated. New measurement strategies and data collection tools also need to be planned and implemented in order to measure objectives for which no current data exist.
- As a result of the extensive community involvement in this process, it became apparent that Mental Health is an area of significant concern. The Community Mental Health Center of Lancaster County has agreed to take the lead in developing objectives for the year 2010 for this area. When this chapter is completed, it will be posted on the website and available in print (estimated date: April/May 2000).
- A report summarizing and prioritizing the needed improvements in the public health infrastructure in the community will be issued by the Board of Health.

2001 and beyond

- The Health Department plans to provide regular health status progress reports on all indicators in Healthy People 2010. A reporting website will be established and updated at least annually.
- Expanding upon this, the Department plans to develop user friendly webpages with a myriad of health data about Lincoln and Lancaster County. This will make important health information available to all the individuals, groups and organizations who are working to achieve the Healthy People 2010 Objectives.

Organization of this Document

Each of the 21 chapters in this document (except Health Disparities) is organized into six sections: Indicators/Objectives for 2010, Health Implications, Current Status and Trends, Health Disparities, Public Health Infrastructure, and Recommendations.

Table 1 for each chapter is a list of the key health indicators related to that topic area. Data is provided regarding current status in Lancaster County, Nebraska and United States. The target objective for 2010 is also identified for local, state and nation. At this time, the target objectives for the state are not available, so this column has dashes in place of data. Some of the indicators are developmental. They represent objectives that are key to improving health status in that area but for which baseline data does not exist. One of the infrastructure issues that will be tackled in the next several years is developing mechanisms for obtaining this baseline data.

The Health Implications and Current Status Sections include brief discussions of the issues and concerns each topic area represents for Lancaster County. Existing disparities in health status are described in the Health Disparities section. Public Health Infrastructure is a brief description of key capacity issues for public health infrastructure. Finally, the Recommendation Sections include suggestions regarding how to begin to address the problems identified and launch needed efforts to reach the target objectives by the year 2010.

We invite all residents of Lincoln and Lancaster County to join together and make our community the healthiest in the nation.

Health Disparities

Goal for the Year 2010: Eliminate health disparities for racial and ethnic minorities, women, people with low incomes and people with disabilities.

Overview

Race, ethnicity and income are significantly associated with health disparities in Lincoln and Lancaster County as well as the state and nation as a whole. The national Healthy People 2010 has established two overarching goals: increase quality and years of healthy life and eliminate health disparities. The Lincoln–Lancaster County Board of Health and the Healthy People 2010 Community Steering Committee embraced these goals for Lancaster County in January 1999.

Eliminating disparities is a bold step forward from the goal of Healthy People 2000, which was to reduce disparities in health status, health risks and use of preventive interventions among population groups. Thus, in the Healthy People 2000 process, special population targets were established for racial and ethnic minority groups, women, people with low incomes, people with disabilities, and specific age groups.

In the Healthy People 2010 process, a single target objective is set for each indicator for all relevant populations. An objective will not be considered achieved unless it is achieved for all population groups.

Eliminating disparities by the year 2010 will require new knowledge about the determinants of disease and effective interventions for prevention and treatment. It will also require improved access for all to the resources that influence health. Reaching this goal will necessitate improved collection and use of standardized data to correctly identify all high-risk populations and monitor the effectiveness of health interventions targeting these groups. Research is needed to better understand the relationship between health status and income, education, race and ethnicity, cultural influences, environment, and access to quality medical services. This will help us acquire new insights into eliminating the disparities and developing new ways to apply our existing knowledge toward this goal.

Achieving the goals of eliminating health disparities and increasing quality and years of healthy life will require a national, state, and local commitment to identify and address the underlying causes of higher levels of disease and disability in racial and ethnic minority communities. These include poverty, lack of access to quality health services, environmental hazards in homes and

neighborhoods, and the need for effective prevention programs tailored to specific community needs as well as the underlying or pervasive effects of racism.

To be successful in meeting this challenge, intentional privilege may be necessary to assure that minorities get appropriate and necessary health care. The goal is not just to decrease disparities but to increase quality and years of healthy life for all populations.

In some cases, achieving the Healthy People 2010 objectives will not be possible without success in improving health status for special populations. For example, in order to effectively reduce the rate of low birth weight infants or teen births requires an emphasis on minority and low-income women and families. To change the proportion of adults as well as the proportion of youth who smoke requires efforts targeted to youth.

In this chapter, you will find a summary of key disparities in health status. These are discussed in more depth in every chapter of the document.

What you will not find are different targets or objectives for minority populations. Instead, the intent is to identify the magnitude of disparity and to regularly report on progress toward narrowing the gap. Over the next ten years, annual reports will be issued showing progress toward the ultimate goal of eliminating the disparities (gap).

Several indicators do not yet have data available to specifically identify differences by race or ethnicity. These indicators are very important to tracking the health of a population. Data is currently being collected for two indicators through the 2000 Minority Behavior Risk Factor Survey and the 1999 Adult Behavior Risk Factor Survey. The 2000 census data is expected to have sufficient information to calculate age-adjusted and poverty rates by age, sex, and race. And finally, new sources of data are being developed to track progress in oral health and immunizations in minority populations.

Table 1 contains a summary list of key indicators which most effectively illustrate existing disparities associated with race and ethnicity. The table will show the current gap between the highest rate and the lowest rate. The subpopulations (White, Black, Asian, Hispanic and Native American) with the highest and the lowest rates are identified. For several indicators, data is currently not available to distinguish rates for each of the minority subpopulations. In those cases, the rates are shown for white and minority populations.

Table 2 presents the most recent Lancaster County data for these indicators selected by each major ethnic and racial group.

Population demographics

The racial and ethnic fabric of Lincoln and Lancaster County has undergone rapid change in recent years. Once a predominantly White community, the population is now more diverse and multiethnic. Racial and ethnic minorities are currently estimated to be slightly less than ten percent of the county population. In the past ten years, Lancaster County has experienced a population growth (12.2%). The percent of increase in the minority population (51.0%) was over six times greater than the percent of increase in the white population (8.4%).

Between 1990 and 1998, 4,777 refugees were resettled in Lincoln and Lancaster County. Over half of the refugees resettled were from Asia, which included: 2,036 Vietnamese, 936 Amerasians, and 67 Laotians. People from Iraq and Bosnia/Herzegovina and

Table 1. Health Disparities

Disparities in health status associated with race and ethnicity
(degree of disparity is the gap between the highest and lowest rates)

	Gap	High Rate		Low Rate	
Age-adjusted diabetes deaths per 100,000 population[1]	43.3	55.9[2]	Minority	12.6[2]	White
Age-adjusted breast cancer deaths per 100,000 population[4]	--	--[3]		--[3]	
Age-adjusted coronary heart disease deaths per 100,000 population[5]	246.9	335.9[2]	Minority	89.0[2]	White
Percent of adults overweight	--	--[6]		--[6]	
Gonorrhea incidence in persons 15–24 years of age per 1,000 population	31.1	32.2[7]	Black	1.1[7]	White
Percent of adults who smoke cigarettes	22.7	44.2[9]	Native American	21.5[9]	Asian
Percent of persons aged 18–25 reporting binge drinking	51.9	72.4[9]	Hispanic	20.5[9]	Black
Infant deaths per 1,000 live births	10.5	16.9[10]	Black	6.4[10]	White
Percent of births that are low birth weight	7.8	14.1[10]	Black	6.3[10] 6.4[10]	White Asian
Percent of mothers *not* receiving first trimester prenatal care	21.1	35.8[2] 34.2[2]	Black Native American	14.7[2]	White
Percent of children aged 19–35 months who are adequately immunized	--	--[12]		--[12]	
Percent of persons aged 65 and older receiving pneumonia and flu immunizations	--	--[6]		--[6]	
Percent of women *not* receiving cervical cancer screening within the past three years	14.7	95.9[9]	Asian	81.2[8]	White
Percent of women *not* receiving mammography screening for persons 40 and older within the past two years	25.2	88.9[9]	Asian	63.6[9] 65.5[8]	Hispanic White
Percent of adults *without* health insurance coverage	37.0	46.1[9]	Native American	9.1[8]	White
Percent of adults who report that they have been told they have hypertension	15.1	22.8[9]	Black	7.7[9]	Asian
Percent of adults who report that they have been told they have high cholesterol	9.6	24.0[9] 23.6[9]	Hispanic Black	14.4[9]	Asian
Percent of adults who report that they have been told they have diabetes	11.9	15.8[9]	Black	3.9[8]	White
Suicides per 100,000 of population	4.1	10.9[2]	White	6.8[2]	Minority
Percent of school children aged 6–18 who have *not* seen a dentist in the past 12 months	--	--[12]		--[12]	
Percent of children under age 18 who live in poverty	--	--[12]		--[12]	
Average age of death for females	26.6	77.5[16]	White	50.9[16]	Hispanic
Average age of death for males	20.8	69.1[16]	White	48.3[16]	Asian

Table 2. Health Disparities

Key indicators of health status in Lancaster County by race and ethnicity categories

Lancaster County Recent Data	Total	White	Black	Native American	Asian	Hispanic	Minority
Age-adjusted diabetes deaths per 100,000 population[1]	13.6[2]	12.6[2]	--[3]	--[3]	--[3]	--[3]	55.9[2]
Age-adjusted breast cancer deaths per 100,000 population[4]	16.6[2]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Age-adjusted coronary heart disease deaths per 100,000 population[5]	103.7[2]	89.0[2]	--[3]	--[3]	--[3]	--[3]	335.9[2]
Percent of adults overweight	--[6]	--[6]	--[6]	--[6]	--[6]	--[6]	--[6]
Gonorrhea incidence in persons 15–24 years of age per 1,000 population	2.5[7]	1.1[7]	32.2[7]	2.9[7]	1.2[7]	4.3[7]	14.7[7]
Percent of adults who smoke cigarettes	21.9[8]	22.3[8]	31.8[9]	44.2[9]	21.5[9]	24.9[9]	28.7[9]
Percent of persons aged 18–25 reporting binge drinking	32.0[8]	34.3[8]	20.5[9]	22.1[9]	30.7[9]	72.4[9]	25.3[9]
Infant deaths per 1,000 live births	7.0[10]	6.4[10]	16.9[10]	12.2[10]	9.2[10]	14.3[10]	12.3[10]
Percent of births that are low birth weight	6.7[10]	6.3[10]	14.1[10]	7.7[10]	7.4[10]	6.4[10]	9.8[10]
Percent of mothers receiving first trimester prenatal care	83.8[2]	85.3[2]	64.2[2]	65.8[2]	72.9[2]	76.2[2]	68.7[2]
Percent of children aged 19–35 months who are adequately immunized	74.0[11]	--[12]	--[12]	--[12]	--[12]	--[12]	--[12]
Percent of persons aged 65 and older receiving pneumonia and flu immunizations	73.2[13]	--[6]	--[6]	--[6]	--[6]	--[6]	--[6]
Percent of women receiving cervical cancer screening within the past three years	18.5[8]	18.8[8]	9.5[9]	10.0[9]	4.1[9]	11.4[9]	6.9[9]
Percent of women receiving mammography screening for persons 40 and older within the past two years	34.5[8]	34.5[8]	28.2[9]	25.0[9]	11.1[9]	36.4[9]	20.0[9]
Percent of adults with health insurance coverage	90.0[8]	90.9[8]	78.2[9]	53.9[9]	68.7[9]	65.2[9]	71.4[9]

Lancaster County Recent Data	Total	White	Black	Native American	Asian	Hispanic	Minority
Percent of adults who report that they have been told they have hypertension	18.7[8]	19.2[8]	22.8[9]	19.1[9]	7.7[9]	8.7[9]	15.9[9]
Percent of adults who report that they have been told they have high cholesterol	16.7[8]	16.9[8]	23.6[9]	20.3[9]	14.4[9]	24.0[9]	21.1[9]
Percent of adults who report they have been told they have diabetes	3.7[8]	3.9[8]	15.8[9]	4.5[9]	5.8[9]	5.5[9]	8.0[9]
Suicides per 100,000 population	10.7[2]	10.9[2]	--[3]	--[3]	--[3]	--[3]	6.8[2]
Percent of school children aged 6–18 who have seen a dentist in the past 12 months	71.3[14]	--[12]	--[12]	--[12]	--[12]	--[12]	--[12]
Percent of children under age 18 who live in poverty	11.1[15]	--[12]	--[12]	--[12]	--[12]	--[12]	--[12]
Average age of death for females	77.0[16]	77.5[16]	59.5[16]	57.2[16]	57.0[16]	50.9[16]	58.6 [16]
Average age of death for males	68.5[16]	69.1[16]	55.4[16]	55.3[16]	48.3[16]	59.6[16]	53.6 [16]

other former Soviet lands were also among the leading nationalities being resettled.

The number of students taking English as a second language increased 261% during these years. In the 1997–1998 school year, at least 35 primary languages were used by children in the ESL program. Nearly 80% of these students spoke either Vietnamese, Spanish, Arabic or Russian.

Even more substantial than overall minority population growth in the county from in-migration has been the increase of minority population births. The annual number of minority resident births increased from 235 births in 1987 to 457 births in 1997. The percentage of total births that are of minority race or Hispanic ethnicity increased from 7.8% in 1987 to 14.2% in 1997. Black, Native-American, Asian and Hispanic populations in Lancaster County experienced significant increases in the number of infants born every year between 1987 to 1997. Of these populations, Hispanics had the largest increase in annual births (125.0%) during this period, followed by Asians (61.2%) and Blacks (46.3%). In 1987, the Black population had the largest number of annual births of all racial and ethnic minorities, but by 1997, Asian and Hispanic births had both grown to exceed the number of Black births.

Income also has an independent and significant impact on health. In Lancaster County minority populations are five times more likely to live in poverty than the White population. Large proportions of Lancaster County women lack health insurance – particularly minority women (one in three) and low-income women (one in five). Lancaster County has seen increases in three demographic factors that have an important impact on health care access, ethnic diversity, poverty and female-headed households. Large proportions of female-headed households live in poverty (one in four), especially those with children (one in three). One-half of female-headed minority families live in poverty – more than twice the percentage for White female-headed families (22%). The majority (71.5%) of female-headed minority families with children younger than five years old live in poverty compared to 40.7% of White families with similar characteristics. Among female headed households and female-headed households with children, Hispanic households are most likely to be in poverty (80.3%), followed by Native-American (77.8%) and Black households (45.2%).

Health Status

The disparities in health status that are associated with race, ethnicity and income are discussed throughout the *Healthy People 2010* document. Each of the following chapters has a section titled Health Disparities. The following bulleted statements summarize key disparities identified and discussed in more depth in these chapters.

- In Lancaster County, infant mortality (IMR) is higher than the minority population than the White population, but this difference is not statistically significant, due to the relatively small number of minority deaths involved. (IMR for 1989–1996)

  9.6 deaths per 1,000 births for minority population
  7.3 deaths per 1,000 births for White population

- The higher infant mortality rate in the minority population is entirely attributable to high infant mortality in the Black population. (IMR for 1989–1996)

18.4 deaths per 1,000 births for Black population

- In contrast to overall decreases in infant mortality, the percentage of infants born with low birth weight (LBW) has gradually, but steadily increased. In Lancaster County, the percentage of low birth weight infants reveals a statistically significant increase from 5.3% in 1991 to 6.9% in 1995. Low birth weight is more prevalent among minority than among White infants. (LBW for 1989–1996)

  8.8% of all minority infants
  5.5% of all White infants
  13.7% of all Black infants

- In Lancaster County, White women are significantly more likely than minority women to receive first trimester prenatal care. (1989–1996)

  87.4% of White women
  76.9% of minority women

- Native-American and Black mothers are the least likely to receive first trimester prenatal care (64.3% and 67.4% respectively in 1989–1996).

- The average age of death (1991–1995) for racial and ethnic minority females (57.5 years) in Lancaster County is approximately 20 years younger than for White females (77.0 years). This is a larger disparity than the 17.1 year difference between White males (68.9 years) and non-White males' (51.8 years) average age of death.

- Among women 50 years and older, 37.7% of White women, 34.9% of racial and ethnic minority women have had an age-appropriate mammogram. (1994)

- Age-adjusted death rates by racial group are difficult to calculate for Lancaster County due to small population and case sizes involved. But in Nebraska, age-adjusted death rates for heart disease and stroke are significantly higher for Black and Native-American populations than for the White population.

- Local behavioral risk factor survey data for both minority and general populations (1993 and 1994) demonstrate vivid contrasts in cardiovascular-relevant behaviors, screening indicators, and health care system access in Lancaster County.

  1. Smoking, binge and heavy drinking, and lack of exercise are more prevalent among in the minority population than in the White population. Elevated smoking prevalence stands out among Black adults, while binge and heavy drinking is significantly elevated for all minority groups in comparison to the White population. Exercise rates are lowest among Blacks and Native Americans.

  2. Native Americans were more likely than any other major racial group to have been told that they have high cholesterol, both as a percentage of total respondents and as a percentage of those who had ever had their cholesterol checked.

  3. Hispanic and Native Americans were less likely than Whites to report having had their blood pressure checked during the past year, and Blacks were most likely to have been told that they have high blood pressure.

  4. Hispanic, Native Americans and Blacks were more likely than Whites to report that they had been told they had diabetes.

  5. In 1994, 17.2% of the racial and ethnic minority population reported not accessing care in the prior year because of cost compared to 8.5% of the White population.

6. Hispanic, Black, and Native-American respondents (BRFS) were far more likely to report lack of health care coverage and inability to see a doctor due to cost.

7. Native Americans were most likely to report not having had an annual checkup and difficulty obtaining transportation for care.

8. Black respondents were most likely to report that racial and ethnic origin is a barrier to receiving services.

9. Hispanic and Native-American respondents were most likely to report that their fair or poor English language skills prevented them from receiving health care services.

10. The prevalence of obesity is particularly high in minority populations, especially among women and low-income persons. Currently, about 47% of Hispanic and 49% of Black women are classified as overweight.

11. Childhood obesity has been increasing since the 1970s, with the result that 21% of all 12 to 19 year-olds are now seriously overweight.

12. Disparity in access to care most affects young adults between the ages of 18 and 24.

13. According to the YRBS, during the past ten years minority or Hispanic students have consistently reported greater rates of use for marijuana and "other illegal drugs" than have their White counterparts.

- Many poorer and less economically developed neighborhoods in Lancaster County have higher percentages of ethnic and minority populations than other areas of the county. Higher concentrations of alcohol outlets are typically found in these poorer neighborhoods. Evidence shows that areas with greater alcohol outlet densities have greater alcohol-related crashes, assaultive violence, youth violence, and alcohol-related pedestrian injuries.
- The rate of asthma hospitalizations in 1995 showed increases over the baselines of 188 per 100,000 for two special population groups – Blacks and all children aged 14 and younger.
- Young children who are poor are disproportionately exposed to sources of lead poisoning and are found to have elevated blood lead levels due to living conditions in old rental properties or poor-lifestyle environments.
- The national mortality rate from cardiovascular disease (CVD) (1995) shows that Blacks have a 40% higher CVD mortality rate than the White population whose disease mortality rate is 40% higher than the Asian population.
- Women who have had a heart attack have poorer health outcomes in general than males who have had a heart attack.
- Nationally, age-adjusted stroke mortality is almost 80% higher in Blacks than in Whites and about 17% higher in males than in females. Moreover, age-specific stroke mortality is higher in Blacks than in Whites in all age groups up to age 84 and higher in males than females throughout all adult age groups.
- In Nebraska, the cancer mortality rate continues to be higher among Blacks than the rates for people of all other races or ethnic origins (1988–1992). The incidence of cervical cancer is higher in both Hispanic and Vietnamese populations than in the White population nationally.
- The prevalence of diabetes is greater in ethnic minority populations including Black, Hispanic, Native-American and Asian groups. Furthermore, these

populations are also at greater risk of developing complications associated with the disease.

- Nationally, among children aged 6–8, 72% of Native-American/Alaskan-Native children, 50% of Hispanic children, 34% of Black children, and 31% of all children experience untreated dental decay.
- National survey results show that 20% of children from families with low incomes and 43% of children in some Native-American populations have baby bottle tooth decay (early childhood caries).
- Recent national studies have disclosed that the overall dental health status of older adults is not good, and that poor oral health is a barometer for general health problems in this population.
- Despite a general reduction in tooth loss in the nation's adult population, 25% of Native Americans and Alaska Natives aged 35 through 44 have fewer than 20 natural teeth; among those aged 55 and older, nearly 75% have fewer than 20 natural teeth.
- Nationally, prevalence of gingivitis is high among Hispanics, Native Americans, and adults with low incomes. The prevalence and severity of periodontal disease increases with age and varies by socioeconomic status.
- Only about half of the people with oral or pharyngeal cancer survive more than 5 years. Tobacco use, especially when combined with heavy alcohol use, is the major risk factor for more than 75% of oral and pharyngeal cancer in the United States. Minorities experience worse outcomes, i.e., Blacks have a much poorer 5-year survival for oral and pharyngeal cancer than Whites (31% vs. 55%). Blacks are less likely than Whites to have regular dental visits.
- When disasters strike a community, those citizens who are at greatest risk are sensitive populations, the homebound, the frail, and the elderly who cannot adequately protect themselves. (The sensitive populations include people in facilities like hospitals, prisons, nursing homes, churches, schools and recreation facilities, any other place where people rely on others to determine their safety).
- Nationally there has been a significant increase in the number of foods imported into the United States. However the present resources for inspection and sampling of the imported foods has not kept up with the demand. The probability is therefore increased that the imported food has been processed in a way that is not equal to standards set by United States Department of Agriculture. Because a majority of this food is consumed by racial and ethnic minorities, it could cause an increased probability for foodborne illness.
- "Environmental Health Hazard Risks In The Minority Community," a study done by the LLCHD in 1997 revealed the following influences on the risk of exposure to toxic and hazardous materials in the minority populations in Lincoln:

  1. The use of hazardous materials for purposes other than their intended use. An example is using gasoline for cleaning car parts.

  2. Accumulation of hazardous materials as a form of wealth.

  3. Consumption of fish from water sources that may contain toxic pollutants. Increased health risks are posed to the Asian population by significantly higher consumption (daily) of fish and reliance on fishing from local water bodies.

4. Distrust of the safety of public drinking water.

5. Lack of familiarity with public facilities for hazardous waste disposal.

- Although childhood immunization rates have been historically lower in minority populations, there has been a significant narrowing of the gap.
- Tuberculosis occurs at higher rates in refugee populations from areas of the world where it is endemic.
- Unintentional injuries are the second leading cause of death for Native-American men and the third leading cause of death for Native-American women.
- Among children, ages 14 and under, Native-American children have the highest unintentional injury death rate in the United States and are two times more likely to die from unintentional injury than White children. Factors that contribute to higher death and injury among Native-American children are more strongly associated with economic conditions than culturally-based differences in parenting.
- Black children aged 14 and under have the second highest unintentional injury death rate in the U.S. and are 1.7 times more likely to die from unintentional injury than White children.
- Children aged 10 and under are injured from falls at a rate of about twice that of the total population. Black children aged 14 and under have a fall-related death rate that is one and a half times higher than that of White children.
- Black children are more than three times as likely and Native-American children are more than two times as likely as White children to die in a fire. Children aged 4 years and under and children with disabilities are at the greatest risk of burn-related death and injury.
- In Lancaster County, the White population has a suicide rate of 12.9 compared to the Black rate of 10.0; Native American, 9.7; Asian, 9.6; and Hispanic, 8.0. (1997)
- Although Black youths have historically had lower suicide rates than have Whites, during 1986–1995, the suicide rate for Black youths, aged 10–19 years, increased from 2.1 to 4.5 per 100,000 population – a 114% increase. Suicidal behavior among all youths has increased in the U.S. during 1980–1995; however, rates for Black youths have increased more.
- Despite having more problematic health conditions on average, older racial and ethnic minority individuals are less likely than nonminority elders to have health insurance or to visit a doctor.
- Barriers to health improvement for certain ethnic groups include the inability to speak or read English, illiteracy in their native language, and a lack of interpreters or bilingual health-care professionals. Lack of knowledge about where and how to access needed services and difficulties in using services because of distance, lack of transportation, or physical impairment also exist.
- The percentage of White births that are teen births has gradually declined in recent years (1987–1995), while the percentages of Asian, Hispanic, and Black teen births have gradually increased.
- Some sexually transmitted disease rates are disproportionate in some minority communities, for example AIDS cases in the Black and Hispanic populations are at higher rates than

their respective percent of the total population. In Lancaster County, 17% of AIDS cases reported were among people of color. The percent of HIV cases reported in Lancaster County among people of color is 24%.

- Large disparities still exist, especially among young people. In 1997, more than 3% (greater than 3,000 per 100,000 population) of young Blacks (15 to 24 year old) had gonorrhea. This compares to 130 per 100,000 for Whites 15 to 19 years old and 104 for Whites 20 to 24 years old. In 1998, young Blacks (15–24 year old) accounted for 19% of all reported gonorrhea cases in Lancaster County, while young Whites accounted for 29% of reported gonorrhea cases.
- National data from 1995 reveal several disparities in smoking prevalence among adults. Men (27.0%) are significantly more likely to smoke than women (22.6%). Native Americans/Alaska Natives (36.2%) are more likely to smoke than other racial and ethnic groups.
- Among adolescents, smoking rates differ between Whites and Blacks. In the 1980s, Black youth showed markedly lower rates of smoking than rates among White teens which were more than three times higher. In recent years, smoking has started to increase among Black male teens but Black female teens continue to have smoking rates considerably lower. Data from the national YRBS indicate that in 1997, 40% of White high school females were smokers compared to 17% of Black high school females.
- Smokeless tobacco use among adolescents also differs significantly by students' gender and race. In 1997, 15.8% of male high school students used smokeless tobacco, compared to only 1.5% for female high school students. Smokeless tobacco use was 12.2% for non-Hispanic Whites, 2.2% for Blacks, and 5.1% for Hispanics.
- Because refuse service is not automatic nor required for single family homes or duplexes, many rental residences do not have refuse service. This most strongly affects the minority and low-income populations in Lincoln.

Community Input

Over the last five months, meetings and focus groups have been held with representatives of four minority groups (Asian, Hispanic, Black and Native American) and people with disabilities. Their insight and feedback has been invaluable to identifying and describing concerns and issues of disparities in health. Some of this feedback is discussed below.

Minority community leaders reminded participants that statistical information is not the only or even the most reliable source of information about a population. It is even more important to understand what the data means, what the implications are and what can be done. Economic status and political power are most critical to changing health status.

Cultural wisdom and knowledge has rarely been valued by the health care community according to many of the participant in meetings and focus groups. The health care system generally has tried to make minority people fit into the health care system box. With the changing population dynamics of this community, it is important for all of us to learn to do business outside of this

box. Culturally competent care needs to be routinely available in Lancaster County.

Ignorance, insensitivity, mistreatment, indifference, and discrimination are adjectives used by many respondents in describing their experiences with the health care system in our community. The inability to communicate (to understand and be understood) across languages and across cultures was cited often.

Several examples of problems experienced by people of color when medical care is primarily focused on serving Euro-Americans include: delayed diagnosis of certain conditions; inability to identify rash illnesses for person of color; and inadequate information about how to care for skin and hair of black infants. A group of black women all shared their common frustration and experience of questions from hospital staff when their children were born. Because a black newborn child's skin is usually much lighter at birth, hospital staff would ask often the mothers who the father really was.

Another area of concern raised was whether specific conditions are recognized or diagnosed in a timely manner. Many immigrants come from parts of the world where tuberculosis and other infectious diseases are endemic. These individuals may not only have active disease but may experience secondary and tertiary consequences of those diseases many years later. Because the initial infection is usually treated immediately in this country, some individuals experience lengthy delays and significant difficulty in getting appropriate treatment for the longer term effects.

Individuals from Hispanic, Native-American and Asian communities discussed the need for more effective education about risk factors and how to prevent disease. They were very concerned about the lack of knowledge in their families and communities regarding prevention of chronic disease. They also described the struggle of adapting cultural patterns of eating and activity in a predominately white community. They perceived a lack of interest in physical activity or exercise that was not a part of work. Risk of obesity was small in traditional or home cultures when people had physically demanding work and ate a diet light in meat. That is changing as they adapt to the American style of life.

The high risk for chronic diseases such as cardiovascular and diabetes in Black and Native-American populations was discussed. Respondents were concerned about a lack of screening activities; lack of knowledge within the population about the need to be screened and how to reduce risk; and difficulty getting the appropriate level of care once a condition was identified. In the Asian population, the difficulties overcoming cultural factors for women to be screened for breast and cervical cancer were identified. Hispanic women discussed their concerns about finding ways to persuade their husbands and fathers to use the health care system. They described a strong cultural tradition (machismo) for men to ignore physical problems of their own and concentrate on supporting and taking care of the family.

Keen interest was expressed by many in increased availability of opportunities for physical activity, especially for children and youth, in schools and in the community. Membership in health clubs and regular opportunities for exercise for adults was desirable but seemed out of reach to most of the respondents.

Concern was expressed about the density of alcohol and tobacco outlets in the low-income areas of town. The perception of many respondents was that the increased density sends the wrong message to their young people and increases access for young people to those products.

Discussion of problems with commu-

nication focused on translation and interpretation. Many individuals expressed concern about the accuracy, sensitivity and trustworthiness of the interpreters. In one focus group for the Hispanic community, participants recommended more emphasis on teaching adults to speak English so they could represent themselves. In other groups, participants recommended setting standards and providing training for individuals who would provide interpretation services for people in medical and health care settings.

While access to care was identified as problematic for all types of health care, two areas of particular concern were identified. Mental health services and oral health services are not readily accessible by most low-income individuals. And within most minority communities, there is an added barrier of perception that it is not needed. However, community leaders in all four minority groups identified culturally appropriate mental health services as a growing and critical need.

When discussing lack of health care coverage, two groups were identified by respondents as having greater difficulty than others: (1) men between 18 and 40 years of age and (2) immigrant elders who did not qualify for Medicare. There are currently insurance programs that cover most children and many women but there is nothing for men if their employment does not include health insurance. Many immigrant elders do not qualify for Medicare and cannot find employment which would include health insurance.

Both community leaders and focus group respondents discussed concern about how funding for services to minorities was distributed. Many expressed a desire to see more community-based programs that were developed and implemented within their own community.

Two of the focus groups highlighted problems specific to persons with disabilities. These included transportation for medical and other needs and barriers created by lack of curb cuts or curb cuts that are improperly designed. Inadequate availability of assisted living facilities was also identified. And they pointed out that many shopping and recreational facilities do not have adequate handicapped accessibility.

Concerns about environmental hazards were discussed. Many centered on conditions of rental housing in low-income areas. The lack of control and inability to get landlords to fix roofs, repaint, provide trash pick-up, and clean up unsafe conditions is a serious concern. Long-time residents in low-income areas of the community also shared their general distrust of government at all levels. They cited examples which included their experience the North East Radial issue. According to one minority leader, “Trust is critical if you want residents to understand potential environmental risks. You have to find the individual(s) within each culture who are trusted and respected if you want environmental health information and education to be accepted.”

Trust, sensitivity, cultural competence, better representation of minorities in the health care work force, greater accessibility to health care, transportation, better housing, and respect were repeatedly emphasized by all participants in minority feedback meetings and focus groups.

Recommendations

These are general recommendations in addition to the specific recommendations found in each of the following chapters:

- Identify, develop and implement adequate data sampling and surveying to track health status of minorities in Lancaster County. Develop analysis and public health comment with the input of advisory groups representing all four minority groups.
- Adopt standards for cultural competence in health care organizations and facilities throughout the community.
- Increase the proportion of health care providers who are members of minority communities.
- Develop standards and training for translators and interpreters who provide translation for medical or health care services.
- Assure that routine preventive health screenings are implemented for those populations most at risk. Educate medical professionals from the student to the community practitioner regarding risk and need for regular screening of these high risk populations.
- Incorporate education about cultural sensitivity into all aspects of educational programs for healthcare providers. Recruitment of medical-school candidates from a variety of cultures can enhance the medical profession in terms of education, information, and the practice of cultural sensitivity.
- Educate consumers so they become active participants in determining their health care status, choices, and options.
- Establish a minority advisory committee to work with the Health Department, Board of Health, Community Health Partners, City, County, and other entities to develop approaches to meet the community health objectives for 2010.
- Rely on minority populations for planning and implementation of health delivery services. Make funding and service decisions with, not for, the communities served. Assist minority communities to identify and obtain funding and other resources.

Notes

Tables 1–2

1. Diabetes defined as ICD code 250.
2. Lincoln–Lancaster County Health Department, Vital Statistics data, 1998.
3. Currently no data source. Age-adjusted rates are currently calculated using 1970 national census data as the baseline population. The racial and ethnic breakdowns from the 1970 census are not available.
4. Breast cancer defined as ICD code 174.
5. Coronary heart disease defined as ICD codes 402, 410–414, and 429.2
6. Currently no data source. Data will be available from the 1998 Behavioral Risk Factor Survey and 1999 Minority Behavioral Risk Factor Survey.
7. Lincoln–Lancaster County Health Department, Sexually Transmitted Disease Surveillance data, 1994–1998.
8. Lincoln–Lancaster County Health Department, *Behavioral Risk Factor Survey*, 1994.
9. Lincoln–Lancaster County Health Department, *Minority Behavioral Risk Factor Survey*, 1994.
10. Lincoln–Lancaster County Health Department, Vital Statistics data, 1994–1998.
11. Nebraska Health and Human Services System, Immunization Program report, 1999.
12. Currently no data source. Data source will be developed in 2000.
13. Lincoln–Lancaster County Health Department, *Behavioral Risk Factor Survey*, 1999.
14. Lincoln Public Schools, Screening Report, November 1999.
15. 1995 Small Area Poverty Estimates, U.S. Census.
16. Lincoln–Lancaster County Health Department, Vital Statistics data, 1993–1997.

Maternal and Child Health

Health Objectives for the Year 2010: Improve maternal health and pregnancy outcomes and reduce rates of disability in infants, thereby improving the health and well-being of women, infants, children, and families in Lancaster County.

Health Implications

As the twentieth century ends, technology, economic resources, and education levels are primary factors that must be addressed to achieve desired outcomes for maternal, infant, and child health. Technological and health-research breakthroughs have brought about improvements in preconception, prenatal, and postnatal care. However, the problem of health disparities remains the primary issue for improvement of maternal and infant health. These maternal/child health disparities are pronounced between white and nonwhite women, with the poorest outcomes seen among the youngest mothers.[1]

Despite the best efforts of health care providers, complications of pregnancy do arise and may lead to fetal or neonatal death. The leading causes of infant death include birth defects, Sudden Infant Death Syndrome (SIDS), prematurity, and low birth weight. Although the exact cause of SIDS is unknown, a significant decrease in the number of SIDS deaths has occurred nationally since the implementation of the "Back to Sleep" campaign, which encourages caretakers to place infants only on their back or side to sleep. Although the campaign has proven successful, some minority cultures are having difficulty adjusting to the new method based on heritage and history.[1]

Prematurity and low birth weight continue to be leading causes of infant death and disability. Infants born with lower than normal birth weight are more likely to experience neonatal death, developmental and neurological disabilities, and other complications. Compared with infants of normal birth weight, low birth weight (LBW) babies are five to ten times more likely to die during the first year of life. A disproportionate number of infants born to minority parents are born prematurely and/or of low birth weight. Through inroads made in medical technology and treatment, significant numbers of preterm infants are living today that would have died ten years ago. For many infants now surviving complicated and often fragile neonatal periods, the lifelong implications of being born too early result in disability, which in turn has an impact on the emotional and financial status of the family as well as the community's ability to meet the growing needs for these children and their families. Continued follow-up and

Table 1. Maternal and Child Health Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Percent of mothers receiving prenatal care beginning in the first trimester	83.8[2]	90.0	83.6[3]	--	82.8[4]	90.0
Percent of mothers using alcohol during pregnancy	1.2[2]	1.0	1.2[3]	--	1.2[5]	--
Percent of pregnant women who did not abstain from alcohol during the past month	--[6]	--	--	--	21.3[7]	5.0
Percent of mothers using tobacco during pregnancy	15.8[2]	2.0	16.3[3]	--	13.2[5]	2.0
Percent of pregnant women who did not abstain from tobacco use during the past month	--[6]	--	--	--	21.5[7]	5.0
Percent of babies born premature (younger than 37 weeks gestation)	8.3[2]	7.0	8.4[3]	--	11.4[5]	7.6
Percent of babies born with low birth weight (less than 5 lbs., 9 oz. or 2500 grams)	6.8[2]	5.0	6.5[3]	--	7.6[4]	5.0
Percent of babies born with very low birth weight (less than 3 lbs. 5 oz. or 1500 grams)	1.3[2]	1.0	1.3[3]	--	1.5[4]	1.0
Infant mortality rate (infant deaths per 1000 live births)	8.0[2]	5.0	7.3[3]	--	7.2[4]	5.0
Percent of mothers who initiate breastfeeding in hospital	--[8]	80.0	68.1[9]	--	--	--
Percent of mothers breastfeeding, early postpartum period	--[6]	--[6]	--	--	60.0[10]	75.0
Percent of mothers breastfeeding at 6 months postpartum	--[8]	50.0	--	--	22.0[10]	50.0

study of the outcomes of preterm, low birth weight infants' growth and development are necessary.

Prenatal care is an essential component of a positive birth outcome. Prenatal care ensures proper education and early detection of risks, which may impact the pregnancy and birth outcome. Health providers are better able to decrease infant mortality, low birth weight, very low birth weight, and neural tube defects as well as other complications by monitoring women with high-risk pregnancies. Pregnant women are more apt to have better pregnancy outcomes if risks can be detected early. Consistent with national trends, Lancaster County reports minority women generally enter prenatal care later than white women.[2]

Preconception counseling regarding maternal health conditions such as diabetes, phenylketonuria, Rh-negative blood type, epilepsy, and chronic hypertension as well as environmental health risks is essential for the birth of a healthy baby. Preconception counseling on proper nutrition (including the folic acid intake), and the effects of tobacco, alcohol, and drug use as well as the promotion of early entry into prenatal care has the potential to significantly improve pregnancy outcomes. For example, adequate intake of folic acid prior to or beginning early in pregnancy could decrease the incidence of spina bifida and other neural tube defects by 50%.[1] Currently there is no data to identify the number of physicians in Lincoln–Lancaster County who routinely discuss pre-pregnancy issues with their patients.

As many as 20% to 30% of the low birth weight infants born in the United States can be attributed to tobacco, alcohol, and illicit drug use.[1] Tobacco use during pregnancy has been linked to low birth weight and very low birth weight infants as well as fetal deaths and a high prevalence of miscarriage. The effects of alcohol use on the developing fetus include Fetal Alcohol Syndrome, Fetal Alcohol Effects, cerebral palsy, and other birth defects. Illicit drug use has been correlated with low birth weight and very low birth weight infants, neurological and developmental impairments, decreased fetal growth, and preterm birth, among other problems. Women using illicit drugs are more likely to contract contagious diseases, such as HIV and Hepatitis B, which put the infant at greater risk. Use of common illicit drugs, such as cocaine or marijuana, during pregnancy is associated with premature birth, impaired fetal growth, and neonatal seizures.[1]

The negative effects of alcohol, tobacco, and drugs as well as prescription medications should be discussed with women of childbearing age prior to and during pregnancy in order to reduce the number of infants with certain birth defects and with low birth weights. With respect to alcohol use, national campaigns continue to assist in public awareness, and physicians are increasingly focusing on abstinence from alcohol during pregnancy.

Preterm births are often an outcome for women of less than ideal weight during their pregnancy. Women within a normal weight range are expected to gain 25–35 pounds; women who are overweight are expected to gain 15–25 pounds; and women who are underweight are expected to gain 28–40 pounds. Women having multiple births are expected to gain the average weight of an infant in addition to the expected weight gain for their weight range.[1]

Prenatal care also affords the health care worker an opportunity to discuss the benefits of breastfeeding. Breastfeeding is the optimal form of nutrition for infants and can have positive effects for both mother and child. Breastfed infants tend to have higher IQs than infants fed breast milk substitutes. Infants who are breastfed for at least six months have three times fewer ear infections, five times fewer urinary tract

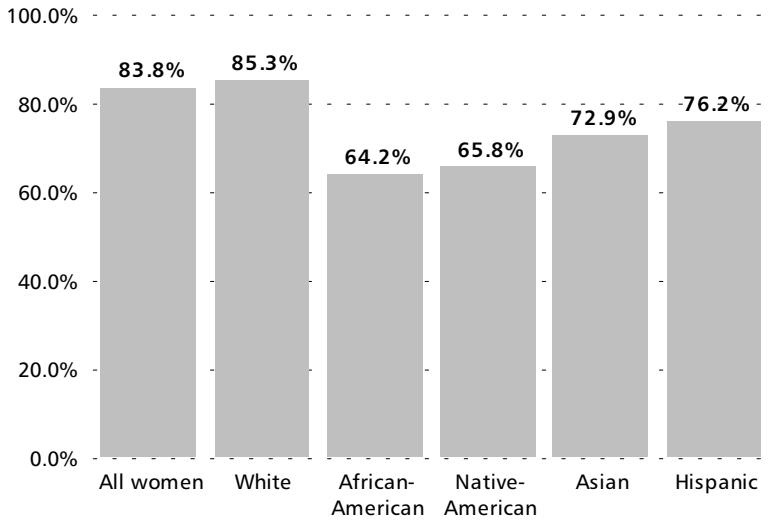

Figure 1: Percent entering prenatal care during the first trimester in Lancaster County, 1998.[1]

infections, five times fewer serious illnesses, and seven times fewer allergies. Breast milk is much more easily digested than formula and results in decreased spitting up, constipation, and diarrhea.[3]

The number of multiple-birth pregnancies has increased dramatically in the past ten years.[4] The greater the number of fetuses carried, the greater the risk for preterm and low birth weight babies. Efforts to enhance pregnancy outcomes for multiple-birth pregnancies has been aided by maternal steroid use prenatally and the use of surfactant after delivery. Nevertheless, continued efforts are needed to enhance the pregnancy outcomes of multiple-birth pregnancies.

Current Status and Trends

Prenatal Care

In Lancaster County in 1998, 83.8% of all pregnant women began prenatal care in the first trimester, a rate similar to national and state rates.[5,6] Following both national and state trends, early entry into prenatal care was much lower for minority women. In particular, 65.8% of Native-American women and 64.2% of African-American women received prenatal care in the first trimester (see fig. 1). Teen mothers also enter prenatal care later than older mothers. The recent decline in entry into prenatal care in Lancaster County is reportedly being attributed to the difficulty in obtaining appointments until the second trimester.[7] Data will need to be gathered to determine if the length of time required to access prenatal care is a legitimate factor for this decline.

Entry into prenatal care means entry into traditional western medicine. Some women may consider themselves "entering into prenatal care" by consulting a maternal leader, cultural "healer," or using cultural medical practices in relation to their pregnancy. This may account for some of the disparity between nonminority and minority women with reference to entry into traditional western medicine's prenatal care. Other disparities may also be related the growing number of non-English-speaking citizens in Lincoln and Lancaster County. Issues related to cultural needs and language translation cause continued access problems for some of these populations. See the Access to Health Care and Health Disparities sections for further discussion.

Alcohol, Tobacco, and Drug Use During Pregnancy

There are two important sources of data on alcohol, tobacco, and drug use during pregnancy. One is the birth certificate, for which tobacco or alcohol use is typically self-reported by the mother. These statistics are considered underreported, particularly for alcohol and drug use.

1998 births data at the local, state, and national levels all indicated a rate of

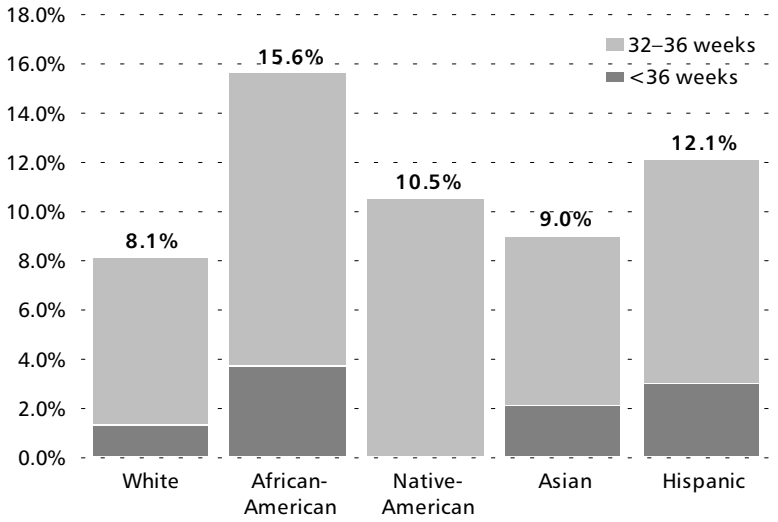

Figure 2: Percent of births that are preterm by race/ethnicity in Lancaster County, 1998.[2]

1.2% of mothers reporting alcohol consumption during pregnancy (see indicators). Household surveys, the second source, are considered a better means of reporting alcohol use during pregnancy. This is accomplished at the national level by the National Household Survey on Drug Abuse (NHSDA). The relevant NHSDA indicator is alcohol use during the past month of pregnancy, and it stood at 21.3% in 1994–95. The national objective is to reduce this number to 5% (see indicators). There is no comparable local or state measure to the NHSDA. Accurate local rates of alcohol use during pregnancy could be obtained using a periodic household health survey.

In 1998 in Lancaster County, 15.8% of pregnant women reported smoking during their pregnancy, compared to 16.3% statewide and 13.2% nationally, again according to births data. National NHSDA data indicate a much higher rate of 21.5% of pregnant women not abstaining from smoking during the past month. The federal goal is to reduce that number to 5% by the year 2010 (see indicators).

Along with alcohol use and smoking figures, statistics on drug use during pregnancy are largely based on maternal self-reporting and are therefore likely to be under reported. Fear of legal consequences and concerns regarding child custody may prevent a woman from admitting drug use. Community awareness campaigns are needed to continue to promote abstinence from drug use, especially during pregnancy.

Prematurity

Prematurity affects 11.4% of births in the United States, 8.4% in Nebraska, and 8.3% in Lancaster County (1998). Lancaster County rates for preterm births for 1998 for were 1.3% for less than 32 weeks gestation and 7.5% for 32–36 weeks gestation. A disproportionately large number of infants born to minority mothers are born prematurely. Nationally and locally, African-American, Hispanic, and Native-American women have especially high preterm birth rates (see fig. 2).[1]

Low Birth Weight

Nationally, 7.6% of infants are LBW, defined as weighing less than 2500 grams. The rate of very low birth weight (VLBW), which is less than 1500 grams, is 1.5%. The LBW rate has risen nationally in recent years.[1] In Nebraska, LBW rates have remained fairly stable; in 1998 6.5% of births were of LBW (see indicators). Although the state LBW rate is relatively stable, these births accounted for more than half (59%) of all infant deaths. The mortality rate of LBW infants is nearly 20 times higher than the rate for normal and high birth weight infants in the state.[7]

Like the nation, Lancaster County is experiencing an increasing low birth weight trend. In 1987, 5.4% of births were LBW compared to 6.8% in 1998. In 1987, 0.6% of births were VLBW, compared to 1.3% in 1998.[2] Based on data gathered from 1989 through 1996, there is a significant difference between the percent of LBW infants born to white (5.5%) and nonwhite women (8.8%).[7,2] African-American women continue to have the highest percentage of LBW infants and VLBW infants, with

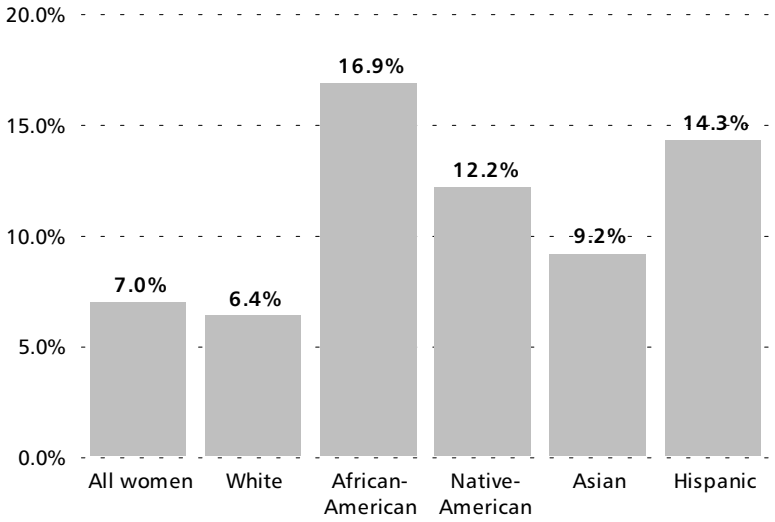

Figure 3: Infant mortality rate (infant deaths per 1,000 live births) in Lancaster County, 1994–1998.[3]

rates of 11.9% LBW and 5.5% VLBW in 1998 in Lancaster County. Low birth weight rates are also high for Native-American (7.9%) and Asian babies (9.7%) in Lancaster County.

Infant Mortality

Nationally the infant mortality rate was at a record low of 7.2 per 1,000 live births in 1998. However, the rate for African Americans remains more than twice that of White infants (14.1 per 1,000 vs. 6.0 per 1,000 in 1998).[5] In 1995, the Native-American infant mortality rate was 9.0 per 1,000, while the rates for Asian and Hispanic infant mortality were comparable to or better than those for Whites (5.3 per 1,000 and 6.3 per 1,000 respectively).[1]

In Nebraska, the infant mortality rate for 1998 was 7.3 per 1,000. The Lancaster County rate for the same year was 8.0 per 1,000. Lancaster County has set an infant mortality goal of 5.0, the same as the national goal. During the most recent five years of births data (1994–1998), the contrast between infant mortality rates for infants born to African-American, Hispanic, and Native-American mothers was particularly dramatic (see fig. 3). The trend for poorer outcomes of low birth weight, prematurity, and infant mortality continues for infants born to African-American women in Lancaster County.

Breastfeeding

Nationally, the overall rate for women beginning breastfeeding in the hospital is 60% (1996). Data provided in 1999 by Lincoln hospitals report that anywhere from 67.5% to 81.2% of mothers, depending on the hospital, are initiating breastfeeding while at the hospital. The rate for breastfeeding declines substantially between delivery and five to six months post-partum, with just 22% of mothers reporting breastfeeding at six months. Comparison data for Nebraska or Lancaster County is not available (see indicators).

National statistics show that 64% of White, 61% of Hispanic, 52% of Native-American, and 37% of African-American mothers initiate breastfeeding. The 1996 rate at five to six months for White women was 26%, among Hispanic women 21.1%, and 12.1% among African-American women. Women in poverty initiated breastfeeding less frequently than higher income women, with women at 150% of poverty initiating breastfeeding at a rate of only 7.2%.[1]

Maternal education levels also play a key role in likelihood of breastfeeding. Of mothers with a college education, 74% initiated breastfeeding, and 48% of those with a high school diploma did so. Less than 25% of women in all economic and ethnic categories continue to breastfeed at six months, with the exception of 31% of college-educated women.[1]

Health Disparities

Throughout areas of health disparity for pregnant women and infants, African-American women continue to have the poorest prenatal and pregnancy outcomes in Lancaster County. Several areas of disparity have been quantified in the narrative above and include later entry into prenatal care, higher rates of preterm delivery, higher rates of low birth weight and very low birth weight infants, and infant mortality. Native-American women have later entry into prenatal care; however, their pregnancy outcomes tend not to be as poor as those of African-American women. Asian women, despite language and cultural barriers, have better outcomes than other minorities; however, Asian births will need further study, as more Asian women are moving into Lancaster County.

Teen mothers also experience health disparities with respect to late entry into prenatal care and a higher incidence of premature deliveries and corresponding low birth weights. Societal pressures continue to have an impact on teen entry into prenatal care and appropriate nutrition and weight gain.

Public Health Infrastructure

Two key measurement goals are targeted for public health infrastructure development in the Maternal/Child Health area. These goals entail closer study and measurement of causes and outcomes for premature and low birth weight infant, and thereby will produce information that will help target efforts to reduce pregnancy complications resulting in premature and low birth weight births.

In the first infrastructure/measurement goal, beginning in the 2000 school year, a data match will be made between Vital Statistics and Early Childhood Special Education programs in the county. The data match is proposed to identify those children born with low or very low birth weight receiving special education services. In addition, data compiled by the Nebraska Health Systems Neonatal Intensive Care Unit (NICU) Follow-up Project will be shared with LLCHD to further study the developmental outcomes of Lancaster County infants completing a stay in any Nebraska NICU. The goal of this 2010 infrastructure development project is to measure the longitudinal outcomes of low-birth-weight infants who in previous years would have died, study the impact of these births on the county and its education and health care systems, and identify opportunities for improvement.

The second infrastructure/measurement goal is to track, beginning in 2000, preterm deliveries due to (a) pregnancy complications or (b) preterm labor unable to be stopped. Data will be gathered and reviewed for causes of preterm deliveries that may be susceptible to targeted community efforts to reduce the number of preterm births. An example of such targeted community efforts could be continued efforts to reduce vaginal infections, which are increasingly correlated epidemiologically with preterm births. Another example could be targeted efforts to reduce smoking and alcohol use among pregnant women, if this can be shown to have an impact on prematurity of infants born in Lancaster County.

Recommendations

- Create systems (as discussed in the Public Health Infrastructure section) to collect and analyze data elucidating causes and outcomes for premature and low birth weight infants to help target efforts to reduce pregnancy complications that result in prematurity and low birth weight. For this purpose, create data linkages between Vital Statistics, Early Intervention records, and NICU, and other data sources, as necessary.
- Increase awareness among medical practitioners and the public regarding culturally appropriate preconception counseling for all women. Materials may include curricula from the March of Dimes or other sources. Through this effort, continue to support the A-1 and March of Dimes efforts regarding adequate intake of folic acid.
- Promote and increase maternal access to prenatal care delivered by a variety of practitioners including physicians, certified nurse midwives, and nurse practitioners. Continue to promote culturally matched support persons for women during pregnancy, delivery, and post-partum. Continue to build upon successful outreach/case management models, such as Healthy Homes (with the addition of outreach workers for the Arabic speaking and Bosnian families) and the High Risk Infant programs.
- Continue to support the national efforts of the "Back to Sleep" campaign to continue to reduce the incidence of SIDS.
- Continue tracking by hospitals of the C-section rate and decrease C-sections.
- Achieve tracking by hospitals of readmissions by birth age in order to identify neonatal hospitalization rates and guide continued teaching/intervention.
- Survey physician's offices regarding women's entry into prenatal care how early in pregnancy are women able to get care.
- Add questions on women's health histories regarding use of over-the-counter and herbal remedies to appropriately address their health risks as related to pregnancies.
- Track multiple-birth pregnancy incidence rates and outcomes as part of the activity discussed in the Public Health Infrastructure section.
- Track very very low birth weight infants (VVLBW), those born weighing less than 750 grams.
- Target male partners in preconception, prenatal, breastfeeding, and parenting education.
- Promote access by all families to parenting education and support, including multimedia access to parenting information (phone service, Web site, etc.).
- Promote and increase hearing screening for infants to detect congenital hearing loss and make referrals for early intervention services.
- Achieve cooperation among hospitals, physician's offices, and the Breastfeeding Coalition to work together to establish consistent initial and follow-up (six and 12 months) collection of breastfeeding data for Lancaster County.
- Develop consumer-friendly resources in the community to help women resolve breastfeeding challenges and increase duration of breastfeeding.
- Promote the Family Violence Council's role in collaborating with community agencies in keeping data and providing health/medical providers with ongoing education and information on identifying and treating women who are battered (with a focus on women battered during pregnancy).

- Promote and increase frequent screening and treatment of vaginal infections to reduce preterm delivery.
- Reenact a Maternal and Child Health Committee for Lancaster County, operating under the Board of Health, to implement recommendations and other task-specific activities (not a "networking" group).

Notes

Related discussion or indicators are located in the chapters on *Healthy Children*, *Oral Health*, *Toxic and Hazardous Materials*, *Tobacco Use*, *Nutrition and Physical Activity*, and *Alcohol and Other Drugs*.

Table 1

-- Currently no data source.
1. U.S. Department of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*.
2. Lincoln–Lancaster County Health Department, Lancaster County Vital Statistics, 1998.
3. Nebraska Health and Human Services System, *1998 Nebraska Vital Statistics Report*.
4. National Center for Health Statistics. *National Vital Statistics Reports*, vol. 47, no. 25, 1998. U.S. births data (preliminary).
5. National Center for Health Statistics, *National Vital Statistics Reports*, vol. 47, no. 18, 1997. U.S. births data.
6. Not chosen for local HP2010. The national indicator and data are shown for comparison to the local indicator and data on the previous line of the table.
7. U.S. Department of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*, 1994–95. Data from National Household Survey on Drug Abuse.
8. Currently no data source. Data is likely obtainable from local hospitals although a common measurement approach needs to be established.
9. Nebraska Department of Health and Human Services, Title V/Maternal and Child Health Federal Block Grant Application (draft), FY2000, July 15, 1999.
10. U.S. Department of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*, 1996. Data from Ross Mothers Survey (Abbott Laboratories).

Figures 1–3

1. Lancaster County Vital Statistics, 1998. Nebraska Vital Statistics, 1998. U.S. Department of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*, 1995 statistics.
2. *ibid*.
3. *ibid*.

Narrative sources

1. U.S. Department of Health and Human Services. "Maternal, Infant, and Child Health," *Healthy People 2010 Objectives: Draft for Public Comment*, 1999.
2. Lincoln–Lancaster County Health Department. "Community Health Status in Lincoln and Lancaster County," *Maternal and Infant Health*. March 1998.
3. Elza, D.D. "The Learning Curve." 4614 Prospect Ave. #421, Cleveland, OH 44103.
4. CDC National Center for Health. Multiple Births Web Press Release. September 14, 1999. "Trends in Twin and Triplet Births: 1980–97." vol. 47, no. 24. 20. pp. (PHS) 99–1120.
5. CDC National Center for Health Statistics Report, Monthly *National Vital Statistics Report*, vol. 47, no. 25.
6. *1998 Nebraska Vital Statistics Report*, Nebraska Health and Human Services System
7. 2010 Maternal and Infant Health Workgroup Anecdotal Report

Healthy Children

Health Objectives for the Year 2010: Improve the knowledge of health, attitudes, and behaviors of children.

Health Implications

The four topics – children's environmental health, adolescent mental health, child care, and school health – and the health indicators selected for this chapter are individually very important to the health of children. There are also numerous topics applicable to this discussion elsewhere in this report that have significant focus for children: Maternal and Child Health, Oral Health, Access to Care, Tobacco Use, Immunizations and Communicable Diseases, Nutrition and Physical Fitness, Alcohol and Other Drugs, Sexual Behavior, and Unintentional and Intentional Injury. Please refer to the table of contents for locating health data, health indicators, and public health comments regarding specific topics as they relate to children's health.

Family income, education-related differences in knowledge, and time to pursue healthy behaviors influence the health and well-being of children. Disparities in these areas are apparent in measurable health factors, such as smoking, overweight, elevated blood lead levels, lifestyle (sedentary vs. active), personal health perceptions (risky behaviors), diabetes mortality, activity limitations, and access to health care (health insurance coverage and medical/dental visits). Progress in meeting health objectives with children and youth is improving primarily in the higher socioeconomic groups, leaving the lower groups to lag behind. Disparity by race and ethnicity is also evident between the general population and at least one select population. Healthy People 2000 identified a disparity of 25% or greater due to race/ethnicity in the areas of overweight, prevalence of diabetes, smoking and use of smokeless tobacco, teen pregnancies, suicides, unintentional injury, asthma hospitalizations, diabetes deaths, and adolescent sexual intercourse.

Children's Environmental Health

Environmental factors play a central role in the processes of human development, health, and diseases of children. Exposure to hazardous agents in the air, water, soil, and food and to physical hazards in the environment is a major contributor to increased morbidity and mortality. The potential health effects of pollutants range from mild sensory irritation to acute toxicity, chronic organ damage to death. The extent of harm to a child depends on the number of factors, including individual susceptibility, and the degree of exposure. Higher disease levels generally are found among members of racial and ethnic

Table 1. Healthy Children Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Percent of related children under age 18 who live in poverty	11.1[1]	10.0	12.6[1]	--	18.9[2]	--
Emergency room visits for asthma per 10,000 children under 15 years	--[3]	40.0	--	--	121.0/81.0[4]	--[5]
Percent of children under 6 years of age with elevated blood lead levels greater than 10 μg/dl	9.9[6]	0	7.3[7]	--	4.4[8]	0[9]
Percent of youth in grades 9–12 who report an injurious suicide attempt within past year	3.2[10]	1.0	2.4[11]	--	2.6[12]	1.8[9]
Percent of child care facilities with no critical item violations at their last regular inspection	84.9[13]	95.0	--	--	--	--
Percent of parents who report that they are able to access affordable, quality child care	--[14]	100.0	--	--	--	--
Percent of junior and senior high schools requiring 1 school year of health education	0	30.0	--	--	20.0[9]	30.0[9]
Percent of children with disabilities whose parents report that they participate in community activities with nondisabled peers	--[15]	75.0	--	--	45.0[9]	60.0[9]

minority groups, children from low income families and children whose parents have less than a high school education.[1]

Asthma, a chronic inflammatory disease of the airways, is the most prevalent serious chronic illness among children. An attack involves spasm of the bronchial tubes or swelling of the mucous membranes, causing difficulty in breathing accompanied by wheezing. Environmental factors such as tobacco smoke, allergens, and upper respiratory infections contribute to asthma morbidity. Most children have relatively mild problems with asthma and can be treated at home or in a doctor's office. For some children, however, the illness can cause serious problems requiring visits to the hospital emergency rooms and multiple hospitalizations. Asthma is the third-ranking cause of hospitalizations among children under the age of 15 and the first-ranking cause among chronic conditions for children.

Lead is highly toxic, and exposure to it is dangerous, especially for children aged six months to six years. Lead poisoning is preventable. Child lead poisoning is caused by the inhaling of lead dust, or the swallowing paint chips, or other lead-contaminated objects. Low levels of lead poisoning may damage the nervous system – including the brain – interfere with growth, harm hearing, lower IQ scores, or make learning difficult. Low-level lead poisoning may also affect a child's behavior, making the child more excitable or less able to concentrate. At high levels, lead poisoning may cause coma, convulsions, and death. Although child lead levels have decreased dramatically in recent decades, largely due to the removal of lead in food cans and gasoline, lead contamination continues to pose a threat to child health. It is now usually acquired by exposure to lead-based paint. Residential paint containing lead was banned in 1978, but paint applied to pre-1950 housing may contain up to 50% lead content. Minority and poor children are disproportionately exposed to sources of lead poisoning. Children aged 1–5 with elevated blood lead levels were more likely to be found among those who are poor, non-Hispanic African Americans living in the inner city or living in older housing.[2] Lead poisoning is preventable, and screening children for lead poisoning provides an early diagnosis to potential problems. Testing is recommended between six months to three years of age.

Adolescent Mental Health

Suicide of adolescents has increased dramatically. Today's youth are often considered to be in a state of crisis. By the time children become teenagers, nearly 20% have already experienced depression at some time in their lives. Approximately half of all adolescents are at moderate to high risk of engaging in one or more self-destructive behaviors, including unsafe sex; teenage pregnancy and child-bearing, drug and alcohol abuse, under achievement, failure, or dropping out of school, and delinquent or criminal behavior. Many of these problem behaviors are interrelated. Some of them are related to a multitude of outside influences including physical abuse, social violence in the streets and at home, and a media that portrays promiscuous sex, drug abuse, and violence as normal behaviors.

Three fundamental human needs are crucial to survival and healthy development. First is the need to be a valued member of a group that provides mutual support and caring relationships. Second is the need to become a socially competent individual who has the skills to cope successfully with life. Third is the need to believe in a promising future with real opportunities. Suicide and other self-destructive behaviors often occur when adolescents feel that filling their needs is an unattainable goal. Scientific research has shown that recognition and appropriate treatment

of mental and substance-abuse disorders is the most promising way to prevent suicide and suicidal behavior in all age groups.

Child Care

The population of Lincoln–Lancaster County includes 38,383 children aged 0–12 years.[3] Sixty-four percent of the women of in the workforce have children under the age of six. Access to quality, affordable child care is a critical issue. Quality care can be defined as that which is licensed, safe, protects the physical and emotional health of children, and meets their developmental needs. Research indicates that quality child-care settings do not negatively affect the emotional and mental health of children and in fact can be a positive developmental influence with the outcome of healthy, happy children.[1] Good child care in which parents have trust and are involved is an extension of the family and contributes to good parenting outcomes. The supervision of late elementary and early adolescent children is also an important issue. Children in self care are exposed to many potential negative effects. These include alcohol, tobacco and other drug use, physical and sexual abuse from other children or adults, and an increased risk of injury.

The need for infant care in Lincoln–Lancaster County is clearly growing.[4] In 1998 there were 3,388 births in the county. The Lincoln–Lancaster County Health Department Child Care Connection, a resource and referral service, received an average of 250 calls a month in 1998 from parents needing care for 266–502 children.[5] Approximately half of these calls were request referrals for infant care. Parents needing care for their infants face three major challenges: availability of infant care, quality of care, and availability of part-time and nonregular hours care.[6] Family income is strongly associated with the degree of difficulty parents have in finding care, with those having lower incomes reporting the greatest difficulty. Current costs for infant care, including both homes and centers, range from $50–150 per week. The first two years of a child's life are critical to the outcome of his or her life. Infants in care can be at a greater risk of abuse, neglect, developmental deprivation, and physical abuse. They require a consistent provider; a safe, healthy, and nurturing environment; good nutrition; and appropriate developmental care.

Frequent mild illness, an average of five to ten per year, is a normal condition of childhood, and the activity level of ill children is age dependent.[1] Children in child care bear an increased burden of infectious disease due to an increased exposure to other children. Infants and toddlers are at particular risk because of limited immune defenses. Most illnesses are common respiratory or gastrointestinal infections, which are not severe and are caused by respiratory and intestinal viruses.

Working parents should be entitled to family sick leave for their ill children. There is a general agreement among health professionals and the public that when a child is seriously ill or when it is not yet clear that the illness is a mild one, the parent should have the right to be at home with the child. When a child is recuperating or has a cold or other mild illness, parents often need alternative arrangements. At a minimum, working parents should be able to use their own sick or personal days to care for their children. However, children are ill frequently, and some parents need help with making alternative arrangements for days when a child is not very ill and the parents need to be at work.[5]

School Health

Schools have more influence on the lives of young people than any other social institution except the family, providing a setting where friendship networks develop, socialization occurs, and norms

that govern behavior are developed and enforced. Healthy children learn better than sick children. The goals of schools are consistent with goals of health promotion. Health promotion is a central facet of the educational goal of schools, which is to prepare youth to lead productive lives. The School Health Education (SHEE) study demonstrated that school health education is an effective means of helping children improve their health knowledge and develop healthy attitudes.[7] School health education can decrease the likelihood that children will adopt behaviors that are hazardous to health, such as smoking. Mandatory health curriculum can and will help our children develop positive health habits resulting in a major impact on the future health of the United States. The cost of poor health habits, such as poor nutrition and inactivity, resulting in obesity and related diseases, is more than $100 billion per year to the nation.

Children with disabilities are those children with limitations in activity because of an impairment or health condition which adversely effects development or educational performance. Various aspects of health and well-being, including access to health care, health promotion, prevention of secondary conditions, and removal of environmental barriers, must be addressed to provide full participation in society by children with disabilities. Inclusion in educational and community activities with nondisabled peers is a crucial part of the social and emotional health of children with disabilities.

Current Status and Trends

Children's Environmental Health

There are 4.8 million American children under the age of 18 with asthma.[8] The number of children with asthma has increased 75% from 1980 to 1994. Prevalence of asthma in preschool children increased 160% from 1980 to 1994, and 5.8% of children under age five were reported to have asthma in 1995.[9] The annual cost of treating asthma in children under age 18 was $712 million in 1995.[9] Of this cost, $295 million was spent on emergency room visits. Asthma is the leading cause of school absenteeism and accounts for 10 million lost school days each year. Children with asthma average twice as many absences from school than children without asthma.[10] The loss in productivity by working parents caring for children who miss school due to asthma is an estimated $1 billion a year.[10] A 1998 Boston-based study of children with asthma who received intensive asthma education, intervention, and follow-up nursing visits experienced a 73% reduction in emergency room visits, 84% reduction in hospitalization rates, and an 82% reduction in outside-plan costs (ambulance, tertiary referrals, and home health care).[9] Annual costs for this group of children with asthma dropped from $78,000 before intervention to $13,700 the year following the intervention. Asthma disproportionately affects minorities and the poor. Although asthma prevalence for nonwhites is only slightly higher than for whites, the asthma hospitalization and morbidity rates for nonwhites are more than twice those for whites.[10] Not clearly understood just why, multiple factors are likely the causes, such as higher levels of exposure to environmental tobacco smoke, pollutants and environmental allergens; lack of access to quality medical care; and lack of financial resources and social support to manage the disease effectively over time.

Although significant progress has been made in reducing elevated blood

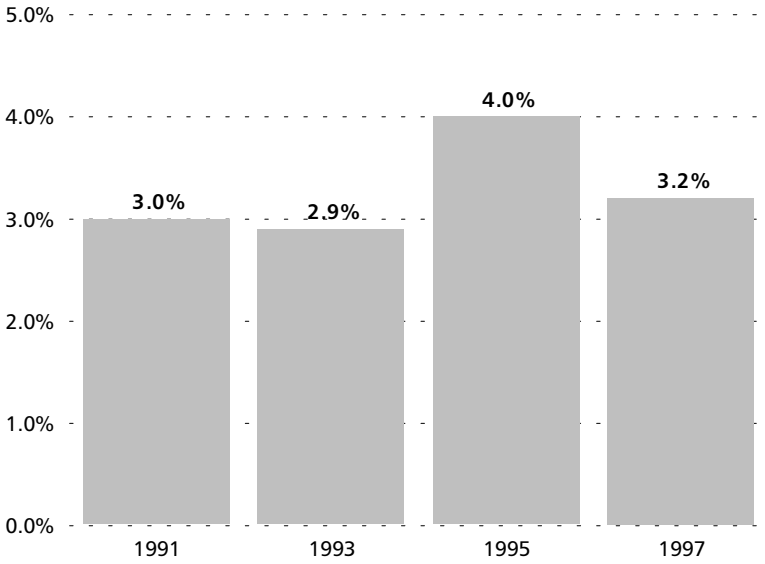

Figure 1: Suicide injury among Lancaster County High School students. Percentage of students who reported attempting suicide during the past 12 months, and as a result, were injured and required treatment by a doctor or nurse.[1]

lead levels (EBLLs) in children, lead poisoning remains a major preventable environmental health problem for children in Lincoln–Lancaster County.[11] Between July 1996 and June 1999, 4,447 children, aged six months to six years, were screened for blood lead levels (BLLs) by the Lincoln–Lancaster County Childhood Lead Poisoning Prevention Program (CLPPP). BLL's among children tested indicate that one in ten (9.9%) of children in high-risk communities have EBLLs of 10 μg/dL or higher.[12] These children are usually living in pre-1950, deteriorating housing and are below poverty-level income. Many of these homes are rental properties. A survey of local physicians revealed that only one in ten physicians always assess potential environmental risks of their child patients.[13] Thirty-five percent indicated they rarely or never discuss environmental risk factors with a child's parents or guardians.

Adolescent Mental Health

Suicide is the ninth leading cause of death in the United States. The risk factors for suicide frequently occur in combination. Scientific research has shown that almost all people who take their own lives have a treatable mental or substance-abuse disorder. The majority have more than one disorder. Suicide remains a complex behavior that requires intensive preventive intervention.

Child Care

Although Lancaster County has more than 816 childcare facilities at present, the need for quality care, especially for infants, remains permanent. Current costs for infant care range from $50–150 per week. The rate range for toddler care is $50–110 per week, and for school-age children the range of cost is $25–110. The highest rates are attributed to center care and care that is developmental in nature rather than custodial. Parents are often faced with selecting care that does not meet their standards due to the high cost of preferable care.

A statewide commission has been set up by the governor to study the costs of child care and to make recommendations for long-term solutions. It is imperative that a sound system for the financing of child care be established to continue with the development of high quality care that keeps pace with the population growth in Lancaster County.

The Kids in Touch Environmentally (KITE) program enables the department to teach childcare providers about environmental conditions and practices that are hazardous to children, so that they can help protect the children in their care. This protection is accomplished through the enlightened actions of the childcare providers – maintaining a healthful environment, engaging in healthful environmental practices, and educating the children to do the same. As a result, the program helps prevent the exposure of children to environmental hazards; raises the overall quality of community childcare resources; raises community awareness of the impact of the environment on children's health; and increases the likelihood that the children, as future adults, will take action to avoid environmental condi-

tions and practices hazardous to children.

The Providers Exceeding Licensing Standards (PELS) is a public-private initiative that supplies family resource specialists to make home visits and assist providers in meeting standards. Providers completing the program are noted on referral lists through child care connection.

Technical assistance is available for child care center staff through either in-service training on a variety of topics or consultations upon request.

Disease prevention and management procedures and checklists have been developed to educate and assist child-care staff when an infectious outbreak, such as shigellosis, occurs. An environmental health specialist does on-site follow-up when a communicable disease has been pinpointed to a facility. A review of sanitation procedures, including correct handwashing, is completed.

School Health

Schools with comprehensive health education did not meet Healthy People 2000 goals. Comprehensive school health education includes eight areas of content: Personal Health and Physical Fitness, Mental and Emotional Health, Prevention and Control of Disease, Nutrition and Weight Control, Death and Dying (optional), Injury Prevention and Safety, Community and Environmental Health, and Consumer Health and Family Education. Baseline data gathering revealed that only 11% of middle schools and high schools met just five of the essential criteria for comprehensive school health education. Only 2.3% of schools met all eight criteria.[14] Only 20% of the county's middle schools and high schools require one school year of health education. Efforts of health educators to promote healthy lifestyles in adults are hampered by habitual behaviors of the adult, often learned early in life. The importance of prevention education at early ages cannot be overemphasized. Success is based on curricula, administrative support, and adequately prepared and motivated teachers. Nebraska law does not mandate comprehensive health education. The Lincoln–Lancaster County Health Department continues to provide information about middle school and high school student attitudes toward healthy lifestyle behaviors to community decision-makers through biyearly youth risk behavior surveys. This survey compares the attitudes of students in Lincoln–Lancaster County with national data.

In addition to comprehensive health education for all students, students with disabilities eligible for special education have unique needs. Within the Lincoln Public Schools, enrollment in special education services has increased 64% from 1989 to 1999, while student growth was only 19.7%.[16] The percentage of boys and girls receiving special education services from Lincoln Public Schools has remained virtually unchanged from 1990 to 1999. In 1990, 31.3% of the special education students were female, while in 1999 this percentage was 31.8%. During the same years, the percentages of males were 68.7% and 68.2%.[3] Contrary to public perception, the cost of educating special education students at Lincoln Public Schools has not increased dramatically over the past six years. For the 1992–93 school year, the average cost of educating a student eligible for special education was $10,907 compared to $11,255 for the 1997–98 school year.[17] Similar data needs to be gathered for the other Lancaster County Schools.

Health Disparities

Disparities in levels of family income, education-related differences in knowledge, and time to pursue healthy behaviors are apparent in measurable health factors, such as smoking, overweight, elevated blood lead levels, sedentary lifestyles, personal health perceptions (risky behaviors), diabetes mortality, activity limitations, and access to health care (health insurance coverage and medical/dental visits). Disparity by race and ethnicity is also evident between the general population and at least one select population.

The rate of asthma hospitalizations in 1995 showed increases over the baselines of 188 per 100,000 for two special population groups – Blacks and non-whites – and all children aged 14 and younger.[15]

The prevalence of serious mental retardation (IQ less than 50) among school-aged children was 4 per 1000, an increase over the 1985–85 baseline of 3.1.[15]

The proportion of children aged six and younger who are regularly exposed to tobacco smoke at home was 27% in 1994.

Baseline data (1994) for comprehensive school health education showed that only 11% of middle schools and high schools met just five essential criteria of comprehensive school health education, and only 2.3% met all eight criteria.

Non-Hispanic, African-American and poor children, aged six months to six years, continue to be disproportionately exposed to sources of lead poisoning and are found to have elevated blood lead levels due to living conditions in old rental properties or poor-lifestyle environments.

Recommendations

Many health problems relate to more than one behavioral risk factor. The most effective community health promotion programs are those that implement comprehensive intervention plans. These plans address factors that negatively influence participation in work, school, leisure, family, and community life.

- Provide risk-behavior prevention programs that cover a wide range of issues that adolescents face. Determine youth assets and expand on them: communication, relationship building, conflict management, and assertiveness and negotiation skills.
- Encourage meaningful, increased communication between parent and child that provides mutual support and caring relationships.

Children's Environmental Health

- Develop effective case management programs for children with asthma, including school commitment that provides students prompt and convenient access to their medications.
- Develop community asthma awareness through regular reports regarding the economic impact on the community, including the loss of productivity by working parents caring for sick children.
- Provide intervention that assures access to medical care, appropriate financial support for asthma medication and monitoring aids, and smoke-free environments for children.
- Apply research findings from studies of co-morbidity of asthma to other child and youth risk factors of tobacco, allergens, and exercise.

- Seek and screen high risk children aged six months to six years for lead poisoning, placing emphasis on early screening at six months to three years of age.
- Develop and implement a comprehensive plan for lead-safe housing for the poor and minorities through collaborations with the private and public housing sectors.
- Encourage primary-care providers to complete and maintain environmental health assessments of child patients.

Adolescent Mental Health

- Promote early access to mental health diagnostic services for children.
- Develop broad-based school and community prevention programs designed to address suicide and suicidal behavior as part of a broader focus on mental health, stress coping skills, substance abuse, and aggressive behaviors.
- Seek to enhance communication between mental-health professionals and primary-care providers so that concepts of mental health are integrated in the overall health assessment of children and youth.
- Promote anti-stigma campaigns for mental-health services, stressing the value and successes of early intervention (as in Head Start and immunization programs).

Child Care

- Encourage development of high quality, affordable infant care options, including those that focus on ethnic preference.
- For mildly ill children, develop sick-child care facilities that focus on a child's needs and allow parents to return to work.
- Provide infant care providers with consistent education and support based on recent brain development research.
- Promote family-friendly options in the workplace that attract and retain good workers and boost productivity, including on-site child care, resource and referral services, and flexible work programs.
- Promote quality child care for children with disabilities.

School Health

- Initiate comprehensive health education curricula for all children in public, parochial, and rural schools of Lancaster County.
- Reinstate a mandatory school health curriculum in all Nebraska schools.
- Encourage continued collaborations with schools to assure comprehensive health education is provided with intensity, duration, and saturation.
- Use programs such as "Tools for Schools" to improve indoor air quality of both schools and childcare facilities.
- Expand utilization of the Mobile Health Clinic to provide comprehensive health services to all children of Lancaster County.
- Promote early identification of children with disabilities to parents, medical staff and physicians, child-care providers, and other health and human service professionals.
- Increase parental and professional knowledge of services for disabilities.

Notes

Related discussion or indicators are located in the chapters on *Maternal and Child Health*, *Oral Health*, *Access to Health Care*, *Toxic and Hazardous Materials*, *Animal Control*, *Tobacco Use*, *Nutrition and Physical Activity*, *Alcohol and Other Drugs*, *Sexual Behavior*, and *Immunization and Communicable Disease*.

Table 1

-- Currently no data source.
1. U.S. Census, 1995 data from small area poverty estimates.
2. U.S. Census, 1998 data from U.S. poverty estimates.
3. Currently no data source. Data is potentially obtainable from local hospitals.
4. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1993–94 data from the National Hospital Ambulatory Medical Care Survey. Rate for children 0–4 is 121 per 100,000 and for children 5–14 is 81 per 100,000.
5. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 2010 national objective is 46 per 100,000 (total population), given a 1992–1994 baseline of 76 per 10,000. Currently no age specific targets are set.
6. Lincoln–Lancaster County Health Department, Childhood Lead poisioning Prevention Program, 1998 data on the percent of children screened annually.
7. Nebraska health and Human Services System, 1998 data on the percent of children screened annually.
8. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1988–91 data from the National Health and Nutrition Examination Survey (NHANES III).
9. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
10. Lincoln–Lancaster County Health Department, Youth Risk Behavior Survey, 1997.
11. The Buffalo Beach Company, *The 1997 Youth Risk Behavior Survey: Summary Tables of Nebraska Data*, 1997.
12. Centers for Disease Control and Prevention, *Youth Risk Behavior Surveillance – United States, 1997*, MMWR, volume 47 (SS-3).
13. Lincoln–Lancaster County Health Department, Child Care Program, 1999 data from child care inspections (required annually).
14. Currently no data source. Data could be obtained through the use of a community survey tool.
15. Currently no data source. Data collection method needs to be established.

Figure 1

1. Lincoln–Lancaster County Health Department, "Youth thoughts on Suicide" Youth Risk Behavior Survey fact sheet, 1999.

Narrative sources

1. American Public Health Association, Caring for Our Children – National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs, 1992.
2. Morbidity and Mortality Weekly Report, 46, no. 7, February 1997, 141–146.
3. Lincoln Public Schools Department of Special Education Statistical Handbook, 1990 and 1999.
4. Lincoln–Lancaster County Health Department, Infant Care Survey, 1998.
5. Lincoln–Lancaster County Health Department, Child Care Connection, 1999.
6. Voices for Children in Nebraska, Kid's Count Report, 1998.
7. Nebraska Department of Education, *Comprehensive Health, Healthier Children – Healthy Nebraska – The Good Life in Action*, 1989.
8. United States, Vital and Health Statistics, Vol. 10, Dec. 1995, pp. 193 (table 62).
9. "Surveillance for Asthma – United States 1960–1995," *Morbidity and Mortality Weekly Report*, Vol. 47 (SS-1), 24 April 1998.
10. Department of Health and Human Services, "HHS Targets Efforts on Asthma," (21 May 1998).
11. Lincoln–Lancaster County Health Department, Childhood Lead Poisoning Prevention Program, Stellar data system, 1996–1999.
12. National Health and Nutrition Examination Survey, NHANES Report III, Phase 2, 1994.

13. Lincoln–Lancaster County Health Department, "Childhood Lead Poisoning: Practices and Beliefs of Lancaster County Physicians," March 1997, pp. 5.
14. Center for Disease Control, School Health Policies and Programs Study (SHPPS) 2000.
15. Department of Health and Human Services Public Health Service, Environmental Health Progress Review, *Healthy People 2000*, 12 March 1997. 11.1, 11.2.
16. Lincoln Public Schools Board of Education Statistical Information, 1998–99.
17. Lincoln Public Schools Special Education Program Budget, 1992–93 and 1997–98.

Older Adults

Health Objectives for the Year 2010: Improve the health and quality of life for older adults.

Health Implications

The United States is experiencing an unprecedented demographic change in the makeup and size of its older population. This "longevity revolution" will make immense social and economic demands upon our nation, most particularly in the area of health care.

Since we now know that many of the negative health conditions of later years can be prevented, postponed, or eliminated through proper lifestyle management and self care, we must make prevention a core component of our health care system. Research should have an increased focus on prevention measures designed to postpone the impact of conditions or illnesses that affect loss of independence in the elderly.

Special outreach to low income and minority individuals at higher risk of illness, injury, and lost years of healthy life is imperative. Often those individuals who would benefit most from health promotion and prevention activities are the least likely to be aware of them and participate.

- By the end of this decade, the number of people aged 75 to 84 will increase by one third to 12.3 million, and people over the age of 85 will increase in number by nearly 70% to 4.9 million.
- By 2040, there may be close to 13 million people over age 85 in the United States, including 1.2 million centenarians.

In 1990, 30,853 individuals in Lancaster County, or 14.4% of the population, were 60 years of age and over. Only 2.4% of the 60+ population were from nonwhite ethnic backgrounds, 12.6% experienced disability, 34.2% were over the age of 75, and 7.4% had incomes below poverty level. During the past ten years, the country has experienced an accelerating demographic shift toward an older population with the greatest growth in that direction among minorities.

Nationally, one third of the total $1 trillion health care budget goes to people age 65 and older. By 2030, persons 65 years or older are projected to account for 21% of the United States population. In ten years, when the Baby Boom generation begins qualifying for Social Security, Medicare, and Medicaid, the vulnerability to age-related diseases will pose a significant challenge to national, state, and local communities as well as to families and individuals.

Table 1. Older Adults Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Persons aged 65 and older who have difficulty in performing two or more personal care activities per 1,000 population	51.6[1]	41.0	46.6[1]	--	--	--
Injuries due to falls for persons aged 65 and older per 1,000 population	47.7[2]	38.0	--	--	--	--
Percent of persons aged 65 and older who engage in no physical activity	38.5[3]	30.8	36.8[4]	--	38.3[4]	--
Percent of persons aged 65 and older who report mental health problems in the past 30 days (stress, depression, problems with emotions)	9.9[3]	8.0	11.7[4]	--	14.5[4]	--
Percent of persons aged 65 and older who have had a professional review of all medications they are taking within the last year	--[5]	90.0	--	--	--	--
Percent of persons aged 65 and older who have participated in at least one organized health promotion program during the past year	--[6]	90.0	--	--	12.0[7]	90.0[8]

Mental and physical health and functional fitness status affect the quality of life of older adults in Lancaster County more than any other factors. This chapter will discuss information and objectives related to physical activity and functional fitness, falls and hip fractures, medication/substance use, mental health issues, and the broad category of preventive screenings and health education.

Current Status and Trends

Physical Activity & Functional Fitness

Many studies demonstrate that exercise can improve one's physical condition and extend life expectancy at any age. Much of the physical frailty attributed to aging is actually the result of inactivity. Even very frail older adults residing in nursing homes show improvement in their abilities to perform activities of daily living after participating in strength training programs.

Exercise helps to tone muscles, which improves balance and agility. It eases tension, decreases stress, and reduces depression. Regular exercise increases a person's functional fitness level, or ability to perform activities of daily living.

Exercise assists in preventing, alleviating, or managing chronic diseases, such as cardiovascular disease, high blood pressure, arthritis, osteoporosis, and diabetes.

Weight-bearing exercise, and strength training help to curb bone loss and in some cases actually increase bone mass.

Falls and Hip Fractures

The consequences of falls with the elderly are many. Eighty-seven percent of fractures occur among people aged 65 years or older and are the second leading cause of spinal cord and brain injury. Half of all elderly adults hospitalized for a hip fracture cannot return home or live independently after the fracture. Osteoporosis is a major cause of fractures.

The National Center for Injury Prevention and Control states that factors contributing to falls among the elderly include dementia, visual impairment, neurologic and musculoskeletal disabilities, psychoactive medications, and difficulties with gait and balance. Environmental hazards frequently contribute to falls. Examples of hazards are slippery surfaces, uneven floors, poor lighting, loose rugs, unstable furniture, and objects on floors. For people aged 65 and over, 60% of fatal falls occur in the home.

Injuries resulting from falls will continue as a leading cause of injury until a comprehensive, multidisciplinary, epidemiologically based prevention effort is established and maintained.

Medication and Substance Use

Lyle Bootman, dean of Pharmacy at the University of Arizona, reported to the American Medical Association in 1995 that prescription drug problems – often caused by patients not taking their drugs properly – cost an estimated $75.6 billion in medical bills and caused 119,000 deaths each year. A cost of $47.4 billion was a result of 8.8 million drug-related hospitalizations. (28% of all hospitalizations).

Prescription drug related morbidity and mortality represents a serious medical problem that urgently requires expert attention. Drug-related problems include not following directions or forgetting to take a drug, taking doses that are too high or too low, being prescribed the wrong drug, not being prescribed a drug when one is needed, and side effects ranging from rashes to death.

Older Americans compose 13% of the population yet purchase almost 30% of nonprescription drugs. In recent years the use of herbal remedies and vitamins has become more popular.

Prescription and over-the-counter drugs are sometimes used inappropriately with alcohol. This lethal combination has been referred to as a hidden epidemic in our older population. Ongoing education and individual consultations explaining the purpose of prescription and other drugs, side effects, dosages, interactions, and length of treatment are an important way to begin conquering the "polypharmacy" problem.

Since 1992, a collaborative effort has been undertaken in Lancaster County to have pharmacists review the medications of older adults in senior centers, residential facilities, and other appointed places. A study of 878 pharmaceutical interventions in five rural areas of Nebraska has also been completed. These efforts have shown the value of medication education and assessment in preventing drug-related hospitalizations, illnesses, and injuries. There is a need to adapt and expand them to meet the needs of a wider and more diverse population.

The high cost of prescription medications is a major problem for many older adults and is considered to be a public health infrastructure problem.

Mental Health Issues

Over the last decade, a striking number of articles in professional journals and the public press attest to the high prevalence of psychiatric disorders in the nations's elderly population. Depression is not a normal part of aging, but in 1996 the National Mental Health Association reported that over 58% of Older Americans think it is. Late-life depression affects some 6 million Americans, but only 10% of these persons ever get treated.

The National Center for Health reported in 1993 that older people (65+) make up the age at highest risk for suicide. Older white males are at greatest risk. Causative factors include depression, alcoholism, losses (loved ones, self-identity after retirement, financial security, health, safety, independence), social isolation, ageism, and poor coping mechanisms. While depression, a major cause of suicide, has an 80% successful treatment rate, older persons tend not to seek mental health help.

The National Mental Health Association reports that 68% of the 65+ population know little or almost nothing about depression and only 38% believe it is a health problem. Older individuals are more likely than any other group to "handle it themselves" and rarely seek help from health professionals or others.

There is a drastic need for public and professional education about aging and mental health, including information to dispel the negative myths of aging and teach successful aging. Nonthreatening depression screenings geared toward older adults could help individuals identify and deal with problems in their early stages. Mental health professionals trained to work with older adults and a local comprehensive geriatric assessment clinic would help to alleviate some of the issues related to geriatric mental health and cognitive decline problems.

Mental disorders were the fifth leading cause of acute inpatient hospitalizations in Lancaster County in 1995–96 and accounted for 7.2% of all hospitalizations. Two of the 23 suicide deaths reported in Lancaster County in 1996 were individuals 60 and over.

Preventive Screenings and Health Education

Community-based health promotion and disease prevention programs have proven to be more effective if they are developed in conjunction with the population to be served. Many older adults frequently seek out and benefit

from such programs. Increased culturally sensitive outreach efforts are needed to meet the needs of persons with mobility or access limitations or low income as well as minority individuals known to be most at risk of illness and injury.

Priority health education and screening areas relate to nutrition, mental health, home and traffic safety, cardiovascular health, diabetes, and osteoporosis. The need for cancer screenings, such as pap smears, mammogram, and prostate, are addressed in other parts of this document.

Older-adult health issues should be addressed through multiple strategies: education, counseling, screenings, environmental enhancements, and protective services. Preventing or postponing the diseases and conditions of aging in older adults can result in dramatic cost savings for the nation.

Health Disparities

Minority older persons are generally identified as members of four non-European populations: African American, Hispanic, Native American, and Asian/Pacific Islander. Nationally, minority persons constitute the fastest growing segment of the elderly population.

In recent years Lincoln and Lancaster County have seen growth in the older minority population as well as an influx of individuals from the former Soviet Union, Bosnia, Iraq, and other countries. A number of these individuals are 60 and older struggling to adjust to being a refugee or immigrant, and in need of culturally competent health services.

Ethnic and racial minority individuals in Lancaster County have significantly shorter life expectancies than nonminorities. Rates of mortality and morbidity for specific diseases vary among the various groups.

Risk factors contributing to greater morbidity and mortality among minority elders include higher rates of smoking, poor nutrition, inadequate housing, and reduced access to or use of health care and health promotion services. Despite having more problematic health conditions on average, older racial/ethnic minority individuals are less likely than nonminority elders to have health insurance or to visit a doctor.

Barriers to health improvement for certain ethnic groups include the inability to speak or read English, illiteracy in their native language, and a lack of interpreters or bilingual health care professionals. A lack of knowledge about where and how to access needed programs and services or difficulties in using the services because of distance, lack of transportation, or physical impairment also exist.

Timidity, suspicion, or reluctance to seek and accept help, possibly due to past experiences with discrimination or a concern about being labeled poor or needy, is not uncommon. Older adults who are members of racial/ethnic minority groups are frequently involved in family caregiving and are more concerned about other aspects of their lives than health unless they experience a problem.

Public Health Infrastructure

Several public health infrastructure issues pertaining to older adults have been identified. The high cost of prescription medications is foremost among these. The need for health care professionals trained to work with the expanding older adult population and the need for a local comprehensive geriatric assessment clinic are also important infrastructure issues. Currently there are very few health care professionals trained and experienced in working with older adults. Individuals must travel to Omaha or elsewhere to access a comprehensive geriatric assessment clinic.

Increased outreach and efforts to provide culturally competent health and health promotion services to low income and ethnic/racial minority older adults identified as being most at risk for illness and injury is also considered a public health infrastructure issue. Community health advocacy encompassing a commitment to health-related policy changes is necessary.

Recommendations

- Advocate for Medicare/Medicaid coverage of prescription medications for all older adults.
- Increase public awareness of issues related to the high cost of medications and polypharmacy as it relates to older adults.
- Provide more consumer education related to the proper us of prescription and nonprescription medications, alcohol and other drugs.
- Disseminate more information related to prevention and self-management in the area of mental health and mental health problems.
- Recruit and train more geriatric mental health practitioners.
- Attempt to ameliorate negative societal attitudes toward aging, which contribute to lowered self-esteem and high rates of depression.
- Improve individual participation in regular physical activity to improve functional fitness and overall physical and mental health.
- Increase outreach to low income and minority older adults.
- Plan and implement a local comprehensive geriatric assessment clinic.
- Raise public awareness of older-adult abuse issues.
- Increase the number of interpreters and bilingual health care professionals.
- Increase participation in preventive screenings and health education programs, especially among low income and minority older adults.
- Increase the percentage of older adults who receive flu and pneumonia immunizations.
- Decrease the incidence of osteoporosis through education, screenings, and assessments.
- Decrease the number of falls resulting in injury through public awareness campaigns and home assessments.

Notes

Related discussion or indicators are located in the chapters on *Chronic Disease*, *Oral Health*, *Nutrition and Physical Activity*, and *Chronic Disease*.

Table 1

-- Currently no data source.

1. U.S. Census data, 1990, special tabulation on aging. Statistics obtained from Lifetime Health/Lincoln Area Agency on Aging.
2. Lancaster County Injury Surveillance Data (E-coded emergency room data), 1992–95.
3. Lancaster County Behavioral Risk Factor Survey (BRFS), 1999.
4. Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System Online Prevalence Data, 1995–98. 1998 national BRFS data from tabulation query: <http://www2.cdc.gov/nccdphp/brfs/age.asp?cat=IM&yr=1997&qkey=2604&state=US>
5. Currently no data source. Efforts by Lifetime Health, the Nebraska Pharmacists Association, and local hospitals are underway to develop a medication risk assessment tool which could be used to measure this indicator.
6. Currently no data source. Could be obtained through a community survey tool.
7. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1995 data from the National Health Interview Survey, (NHIS).
8. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.

Chronic Disease

Health objective for the year 2010: Improve the quality of life by reducing premature death, disability, and the economic costs associated with chronic diseases, especially cardiovascular diseases, cancer, and diabetes.

Health Implications

The term "chronic," as defined by *Taber's Cyclopedic Medical Dictionary*, means "long, drawn out; of long duration; designating a disease showing little change or of slow progression and long continuance." This is an apt description of the three chronic diseases discussed in this chapter: cardiovascular disease, cancer, and diabetes mellitus. With cardiovascular disease being the leading cause of death in the United States, cancer the second, and diabetes the seventh, it is estimated that the morbidity and mortality costs of these three chronic conditions is more than $334 billion annually. This number does not include reduced or lost productivity costs for the working-age population. It also cannot begin to reflect the immense emotional cost in human suffering incurred as a result of these diseases. Research suggests that at least half (and probably many more) of these chronic-condition cases could be avoided through the practice of lifelong healthy behaviors, especially those related to tobacco use, diet, and physical inactivity. The importance of making healthy behaviors the norm throughout life and for all populations cannot be underestimated.

Cardiovascular Disease

Cardiovascular diseases account for more than 40% of all mortality in the United States. About one in four Americans (nearly 59 million), have one or more forms of cardiovascular disease (CVD), including high blood pressure, coronary heart disease, and cerebrovascular disease. One in six men and one in eight women aged 45 and older have already had a heart attack or stroke. Major modifiable risk factors for CVD include high blood pressure, high blood cholesterol, and tobacco use. Other important risk factors are obesity, physical inactivity, and diabetes. An individual's risk of developing CVD is strongly correlated with the number of risk factors that the person has. High blood pressure increases the risk of developing coronary heart disease by two to four times and of having a stroke by four to six times; high blood cholesterol levels (greater than 240 mg/dL) double the risk of developing coronary heart disease. In 1994, 84% of adult

Table 1. Chronic Disease Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Age adjusted deaths per 100,000 population						
Cardiovascular disease[2]	170.0[3]	195.0	--[4]	--	--	--
Coronary heart disease[5]	100.3[3]	51.0	--[4]	--	108.0[6]	51.0
Stroke[7]	34.0[3]	16.0	40.1[8]	--	25.0[9]	16.0
Cancer (all forms)[10]	150.1[3]	103.0	150.7[8]	--	122.9[9]	103.0
Lung cancer[11]	39.5[3]	33.0	42.2[12]	--	36.9[9]	33.0
Breast cancer among women[13]	32.6[3]	26.0	22.2[8]	--	21.0[6]	16.6
Colorectal cancer[14]	13.6[3]	8.8	16.7[12]	--	11.8[9]	8.8
Prostate cancer among men[15]	14.1[3]	12.0	19.9[8]	--	--	17.1
Diabetes[16]	14.0[3]	12.0	14.1[8]	--	13.6[9]	12.0
Risk factors						
Percent of adults with high blood pressure[17]	23.6[18]	16.0	23.0[19]	--	20.0[20]	16.0
Percent of adults who have had their blood cholesterol checked within the preceding five years	65.7[18]	75.0	60.0[19]	--	69.1[20]	75.0
Percent of adult females who have received a Pap test within the preceding three years[21]	88.1[18]	85.0	83.0[19]	--	84.9[22]	85.0
Percent of women aged 50 and older who have had a mammogram within the preceding two years	77.6[18]	85.0	69.7[22]	--	75.2[22]	--
Percent of males aged 50 years and older who have had a prostate exam within the preceding two years	--[23]	50.0	--	--	--	--
Percent of adults aged 50 and older who have had a digital rectal exam within the past two years for colorectal cancer	29.7[24]	75.0	--	--	30.0[25]	75.0
Percent of adults with diabetes[26]	5.1[18]	4.5	5.2[19]	--	5.4[22]	--

Nebraskans reported having one or more risk factors for CVD.

Modifying risk factors, such as stopping tobacco use, lowering high blood pressure, lowering high blood cholesterol, reducing overweight and obesity, increasing physical activity, and controlling diabetes reduces the risk of heart disease. Small changes can make a big difference. Decreasing body weight by only ten pounds can lower blood pressure, and a 1% reduction in a person's total blood cholesterol level can result in at least a 2% decrease in the risk of developing heart disease.

Cancer

According to American Cancer Society (ACS) estimates, 1,221,800 new cancer cases would have been diagnosed in 1999, and approximately 564,800 people would have died of cancer during the year. Cancers of the lung, prostate, breast, and colon/rectum are the four leading cancer sites for all racial and ethnic populations in the United States and together account for more than 50% of all newly diagnosed cancers.

The prospect of preventing and surviving cancer continues to improve. Perhaps 50% or more of cancer incidence can be prevented through smoking cessation and changed dietary habits. The scientific evidence identifying smoking as a cause of cancer has been recognized for more than 30 years. Evidence of a potential link between diet and cancer has emerged over the past decade and has progressed to the extent that recommendations for prudent dietary changes can now be made. Among the dietary recommendations are adequate dietary fiber, fat in moderation, and an emphasis on the intake of fruits, vegetables, whole grains, and low-fat dairy products.

Diabetes

Diabetes, especially Type 2 diabetes (previously called adult-onset diabetes), and the complications associated with diabetes, are substantially increasing both in the United States and throughout the world. An estimated 15.7 million people (8% of the U.S. population) have diabetes. This increase in the disease has been especially prevalent in the minority communities. In addition, the age of onset for Type 2 diabetes has been steadily decreasing and is now being found in teenagers and preteens. Diagnosis of Type 2 diabetes in teens has been especially common among the American Indian population but is increasing among teens of all populations. The commonalities among these teens – obesity and physical inactivity – add to the ever-mounting evidence that appropriate diet and adequate exercise are paramount to good health and can protect from chronic disease. It is estimated that fully 45% of all diabetes mellitus cases could be prevented through control of obesity.

Diabetes is the leading cause of nontraumatic amputations, blindness, and end-stage renal disease. Cardiovascular disease is the leading cause of death among people with diabetes, accounting for over half of all deaths in this group nationally. Persons with diabetes were six to ten times more likely to be hospitalized for heart disease or stroke than the nondiabetic population. Early diagnosis, aggressive management, and treatment are critical to maintenance of good health for those with diabetes. Frighteningly, an estimated one-third to one-half of people with diabetes do not know they have the disease. The need for ongoing public education about signs and symptoms of diabetes and screening for the condition is an obvious public health necessity.

Current Status and Trends

Cardiovascular Disease

Over the past 20 years, the death rate for cardiovascular disease has declined by 46% in the United States. Dramatic decreases in mortality due to coronary heart disease and stroke were primarily responsible for this overall reduction. Changes in technological and medical advances along with lifestyle and risk-factor reduction contributed to the decline. However, CVD is still the leading cause of death, killing nearly as many Americans as all other diseases combined. Because approximately two-thirds of heart attack patients do not make a complete recovery and the majority of stroke survivors are left with some degree of impairment, CVD is also the leading cause of limitation in physical activity, of hospital bed use, and of Social Security Disability claims.

The mortality rate in the general population has declined significantly over the past 35 years, with absolute declines being greater in males than in females. Contrary to the belief of many women, cardiovascular disease, not breast cancer, is the leading cause of death among women.

Although stroke death rates have been decreasing, the decline among African Americans has not been as substantial as the decline in total population, even with improvements in the detection and treatment of high blood pressure. The National Center for Health Statistics estimates that the average American can expect to live 5.5 years longer today than was the case even 30 years ago, and nearly 4 years of that gain in life expectancy can be attributed to our progress against CVD, including coronary heart disease and stroke.

In Nebraska 3,269 deaths resulted from coronary heart disease in 1993. The mortality rate for that year (85.6 per 100,000 population) was down from the 1987 baseline of 114 per 100,000 population. Age-adjusted mortality data for heart disease show substantial differences between racial and ethnic groups across the state. Mortality rates were much higher for Native Americans and African Americans than for Whites in Nebraska. Rates for Asian Americans and Hispanics were much lower.

The improvements made in diagnosis and treatment of CVD are remarkable, however; positive lifestyle behaviors remain critical to cardiovascular health and the prevention of heart disease. Obesity and sedentary lifestyles are becoming more common among all sectors of the American population, including school-age children, for whom heart disease prevention efforts may be most effective.

In addition, personal responsibility for knowing blood pressure and cholesterol levels cannot be overemphasized. In Nebraska, the majority of respondents in the Behavioral Risk Factor Surveillance System Report (BRFSS), 92%, stated they had their blood pressure checked within the past two years. The proportion of adult Nebraskans who have ever been told they have high blood pressure has remained fairly stable, ranging from 20% to 22% between 1987 and 1995. In Lancaster County, an impressive 70% of the population reported having had a blood pressure check within the past six months. The 1995 Nebraska BRFSS also reports that 67% of respondents indicated having their blood cholesterol checked, with another 31% saying they have never had it checked. In Lancaster County, 67% of the population reported

having a blood cholesterol checked in the past five years. However, among the minority population, only 50% reported following this screening recommendation.

Cancer

Of the 250 million Americans now living, about 75 million will develop cancer at some time in their lives. Cancer may strike at any age but is more common in older persons. Overall, 70% of cancer deaths occur in the age group 65 years and older. Research has shown that many cancers can be prevented or cured if they are detected and treated in the early stages of the disease. Average survival time for people with cancer is also increasing, although survival rates vary among population subgroups by type of cancer and by stage of the disease at the time of diagnosis.

The potential for reducing cancer incidence and mortality through prevention and early detection strategies appears to be great. Diet is believed to be responsible for approximately 30–40% of all cancer deaths, smoking at least 30%. Even though progress has been made in reducing the percentage of adult smokers since the 1964 Surgeon General's Report on Smoking and Health, 23% of the adult population still smokes, and the greatest percentage of decline has been in men. More women will be battling lung cancer than men at the start of the twenty-first century unless a sharper decline in the number of women who smoke occurs. Lung cancer mortality rates continue to exceed the mortality rates for breast cancer in women. In contrast, white males, who have reduced or stopped smoking, have begun to experience a decline in lung cancer incidence.

In Nebraska and Lancaster County, approximately 21% of the adult population uses tobacco. While the percentage of adult tobacco users has remained relatively constant for the past few years, the incidence of youth tobacco use has continued to increase. The 1997 Nebraska Youth Risk Behavior Survey (YRBS) reports that 39% of 9th–12th grade youth used tobacco in the past 30 days prior to the survey. The Lancaster County YRBS reports 38% of youth, more girls than boys, using tobacco in the past 30 days prior to the survey. Roughly one-third of the youth that continue to use tobacco will die of a tobacco-related illness.

In Lancaster County, nearly 57% of new cases of cancer are found in the prostate, breast, lung, and colon or rectum. Lancaster County men are more likely to develop cancer and more likely to die from the disease than are women. This is consistent with national trends. In the United States, men have a one in two lifetime risk of developing cancer; for women the risk is one in three. For Lancaster county men, the prostate is the leading site for new cancer cases, but lung cancer is the leading cause of cancer deaths. In women, the breast is the leading site of new cancer cases and breast cancer is also the leading cause of cancer mortality, followed closely by lung cancer. This differs from national trends in which more women die from lung cancer than breast cancer. In an average year, 94 Lancaster County residents die of lung cancer, 42 die of colorectal cancer, 38 women die of breast cancer, and 22 Lancaster County men die of prostate cancer.

Diabetes

There are approximately 80,000 new cases of diabetes diagnosed each year in the United States. According to the Nebraska Behavioral Risk Factor Surveillance System (1995–96), approximately 135,000 Nebraskans currently have diabetes, although only about one-half of them have been diagnosed. The Centers for Disease Control estimate that, each year in Nebraska, diabetes contributes to an average of 345 amputations, 83 cases of kidney failure, and

241 cases of blindness. It causes long-term reduction in activity for 21,178 residents. The rate of diabetes-related mortality for minority populations is substantially higher than the rate for the white population in Nebraska and the United States. In Nebraska, diabetes-related mortality rates per 100,000 population from 1989 through 1993 for Hispanics (50.5), African Americans (70.1), and Native Americans (138.1) far exceeded the rate for Whites (32.3).

The statistics on the two major controllable factors in the prevention or management of diabetes, obesity, and physical activity are dismal. The prevalence of overweight in children and adults in the state and country has been rising over the last decade. More than one-third of adult Americans are currently overweight. Among minorities, this figure reaches nearly 50%. The incidence of overweight in children has become epidemic, with one in five children currently overweight or obese. The Nebraska BRFS reports that about 28% of adults were overweight in 1994. Since 90% of diabetes cases are Type 2, it is estimated that about 45% of all diabetes mellitus cases could be prevented through control of obesity.

Moderately vigorous physical activity accumulated over the course of the day can also lower the risk for Type 2 diabetes. Nationally, 23% of persons with diabetes reported having no leisure-time physical activity (as defined as physical activity lasting thirty minutes or more per session five or more times per week). The Nebraska rate was also 23%, and Lancaster County had a rate of 19% of people with diabetes who did not participate in leisure-time physical activity. However, the percent of persons with diabetes that reported participation in weekly physical activity was 23% nationally, 21% for Nebraska, and 32.5% for Lancaster County.

Health Disparities

Major disparities exist for minority and low-income population groups, with a disproportionate burden of death and disability from the three major chronic diseases addressed in this chapter weighing on them. The difference between the races represents a monumental challenge in understanding the reasons for these differences. Additionally, it affords a unique opportunity to lower morbidity and mortality rates while increasing survival rates in these population subgroups.

Significant factors that must be addressed when discussing health disparities involve access issues. These include access to early disease detection through health screening exams, access to health care, and access to appropriate follow-up treatment resources. This holds true for cardiovascular disease, cancer, and diabetes. In addition, barriers related to language and culture impact, often negatively, the health status of the individual.

Cardiovascular Disease

An interesting picture emerges when viewing national heart disease data. The mortality rate from CVD (1995) shows that African Americans have a 40% higher CVD mortality rate than the White population, whose disease mortality rate is 40% higher than the Asian population. Disparities extend to risk factors of CVD including hypertension and high cholesterol levels. Women who have had a heart attack have poorer health outcomes in general than males. CVD management barriers include delayed diagnosis and treatment implementation for heart disease.

Stroke mortality is another facet of CVD. The African American population is

affected more by stroke than any other population subgroup in the United States. Age-adjusted stroke mortality is almost 80% higher in African Americans than in Whites and about 17% higher in males than in females. Moreover, age-specific stroke mortality is higher in African Americans than in whites in all age groups up to age 84 and higher in males than females throughout all adult age groups.

Cancer

Disparities exist in both mortality and incidence rates for cancer. Statistics show that African-American men and women have higher age-adjusted incidence and mortality rates for many cancers and lower survival rates than do Whites for all but six of 25 primary cancer sites. For men and women combined, African Americans have about a 35% higher cancer death rate than Whites. In Nebraska, this trend in cancer mortality among African Americans continues to be higher than the rates for people of all other races or ethnic origins for the 1988–92 time period. The incidence of cervical cancer is higher in both Hispanic and Vietnamese populations than in the white population nationally.

Prevention and early detection can drastically reduce the risk of death from cancer. The complete lack of any screening exams, not being screened regularly, and limited access to follow-up treatment are reasons for the higher mortality rate from breast cancer in the African-American community than among White women. Hispanic, American Indian and Alaska Native, and Asian and Pacific Islander women have low rates of screening and treatment, limited access to health facilities and physicians, and barriers related to language, culture, and negative provider attitudes. Eliminating these differences is vital and will be the focus of attention on the national as well as the local level.

Diabetes

The prevalence of diabetes is greater in ethnic minority populations including African American, Hispanic, Native American, and Asian groups. Furthermore, these populations are also at greater risk of associated complications of the disease. Factors such as poor nutrition and poor or nonexistent participation in an exercise regimen influence the onset of diabetes. Another major contributor to this disparity involves the lack of access to educational, preventive, and control programs for diabetes. This, in turn, affects diagnosis identification, thus escalating the incidence of disease severity. Each of these factors impacts the other, creating a vicious cycle. By identifying and tracking reasons for disparity in diabetes health outcomes, specific areas of program deficiencies can be targeted.

Public Health Infrastructure

The ability to reduce morbidity and mortality from chronic disease depends in part on the existence and application of many types of resources. First, the means to provide information to the public and to health care professionals on prevention, early detection, and treatment is essential. For example, although prostate is the leading site of new cancer cases in Lancaster County and the rate of prostate cancer among African American men is double that of the general population, few resources are dedicated to public awareness and screening for this cancer.

Second, there must be systems for providing patients with access to appropriate and effective treatment. Third, the mechanism for maintaining continued research progress and for

fostering new research is crucial. These needs can only partially be met with the network of chronic disease control resources currently in place. Gaps in the network exist, and it is imperative that these gaps in the transfer of information, optimal practice patterns, research capability, and other areas be recognized and filled to meet chronic disease prevention and control needs.

With research suggesting screening as a significant preventive measure for most types of chronic disease, the screening guidelines must be considered an essential component to health care. Primary care providers along with public and private agencies must work together to develop and implement screening protocol for identification of risk indicators, risk reduction management, and closer collaboration with patients. In addition, the health department and community will need to identify resources that will allow high-risk population groups access to these essential screenings and treatment services if we are to have an impact on eliminating health disparities.

Recommendations

Aggressive educational efforts, directed to both the public and health professionals, about the necessity of practicing lifestyle behaviors that prevent chronic diseases must be amplified and maintained.

- Public educational efforts should be intensified regarding the effectiveness of screening using consistent guidelines.
- Health screenings for high blood pressure, high blood cholesterol, diabetes, colo/rectal cancer, prostate cancer, and breast and cervical cancer (mammography and pap tests) must be made routinely available to the community and especially to those populations at greatest risk.
- A community-wide and comprehensive approach to reducing the rate at which children start to use tobacco, to expanding and enhancing cessation efforts, and to protecting the public from exposure to secondhand smoke must be adopted and implemented.
- Physicians and other health care providers must routinely counsel their patients on the importance of smoking cessation, healthful diet, and physical activity.
- A comprehensive campaign to promote a healthful diet including at least five fruits and vegetables a day, high fiber, whole grains, and low-fat dairy should be instituted through a partnership of agencies and associations.
- An aggressive promotion of physical activity through existing programs and through further development of partnerships and programs would help make physical activity a part of the community culture.
- Promote consistent and age-appropriate and educational-level-appropriate chronic disease prevention education and interventions at schools, churches, and worksites.
- Ensure access for all to health care through identification of gaps in service, collaboration among agencies to fill the gaps and remove barriers, and utilization of the Mobile Health Clinic where appropriate.
- Promote and implement educational campaigns in a manner that is culturally sensitive and language appropriate.
- All persons with diabetes should receive an annual dilated eye examination, semiannual foot examination, and annual glycosylated hemoglobin (GHb) assessment.

Notes

Related discussion or indicators are located in the chapters on *Older Adults*, *Tobacco Use*, and *Nutrition and Physical Activity*.

Table 1

-- Currently no data source.

1. U. S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. Cardiovascular disease defined as ICD codes 401-405 (hypertension), 410-414 (ischemic heart disease), 420-429 (other heart disease), and 430-438 (cerebrovascular disease).
3. Lincoln–Lancaster County Health Department, Vital Statistics, 1998.
4. Currently no data source. Could be obtained from the Vital Statistics data at the Nebraska Health & Human Services System.
5. Coronary heart disease defined as ICD codes 402, 410-414, and 429.2.
6. U. S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1995 data from the National Vital Statistics System.
7. Stroke defined as ICD codes 430-438.
8. Nebraska Health and Human Services System, *Vital Statistics Report*, 1998.
9. Centers for Disease Control and Prevention, National Center for Health Statistics, "Births and deaths: Preliminary Data for 1998," *National Vital Statistics Reports*, vol. 47, no. 25, October 1999.
10. Cancer defined as ICD codes 140-208.
11. Lung cancer defined as ICD codes 162.2-162.9.
12. Nebraska Health & Human Services System, Nebraska Cancer Registry, 1997.
13. Breast cancer defined as ICD code 174.
14. Colorectal cancer defined as ICD codes 153.0-154.3, 154.8, 159.0
15. Prostate cancer defined as ICD code 185.
16. Diabetes defined as ICD code 250.
17. Percent of adults who have been told by a health professional that they have high blood pressure.
18. Lincoln–Lancaster County Health Department, Behavioral Risk Factor Survey, 1999.
19. Nebraska Health and Human Services System, Dept. of Regulation and Licensure, *Behavioral Risk Factor Surveillance System Report,* 1995–1996.
20. Division of Adult and Community Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, *1997 BRFSS Summary Prevalence Report*.
21. Percent of women who have not had a hysterectomy who have had a Pap test within the preceding three years.
22. Division of Adult and Community Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, *1998 BRFSS Summary Prevalence Report*.
23. It is unfortunate that prostate exam screening data is not available from the standard national behavior health surveys. This data could be collected locally through a community health survey.
24. Lincoln–Lancaster County Health Department, Behavioral Risk Factor Survey, 1989.
25. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1993 from the National Health Interview Survey.
26. Percent of adults who have been told by a doctor that they have diabetes.

Oral Health

Health Objectives for the Year 2010: Improve oral health status and decrease morbidity and mortality related to oral health problems.

Health Implications

More than half of all children aged 5 to 17 and 99.5% of Americans aged 65 and older have had cavities in their teeth. Millions of people in the United States have developed periodontal disease, and more than 17 million people nationwide have lost all their teeth.[1] Oral diseases that include dental caries, periodontal disease, and tooth loss afflict more persons than any other single disease in the United States and result in needless pain and suffering; difficulty speaking, chewing, and swallowing; increased costs of care; loss of self-esteem; decreased economic productivity through lost work and school days; and, in extreme cases, death.[2] For many people, the appearance of badly decayed and missing teeth and gum disease has prevented the opportunity for employment.

In addition, oral and pharyngeal cancer, which affects primarily adults older than 55, results in the diagnosis of 30,000 new cases annually, significant morbidity and disfigurement associated with treatment, substantial cost, and 8,000 deaths annually. The five-year survival rate for this cancer is 52%, and it is more common than leukemia, Hodgkin's disease, and cancers of the brain, cervix, ovary, liver, pancreas, bone, thyroid gland, testes, or stomach. Oral and pharyngeal cancer is the tenth most common cancer found among U.S. men and the fourteenth most common among U.S. women.[3]

Poor dental health is particularly detrimental to children because it affects their nutrition, growth and development, and ability to learn. Dental disease has also had a significant impact on economic productivity through lost work and school days. In 1989, more than 164 million hours were missed from work (an average of 1.48 hours per employed U.S. adult), and nearly 52 million hours of school were lost (1.17 hours missed per child) because of dental treatment and problems.[2]

Infections in the mouth can enter the blood stream and harm major organs. One example is bacterial endocarditis, a condition in which the lining of the heart and the heart valves become inflamed resulting in a 50% mortality rate.[4] The presence of oral disease can jeopardize any organ transplantation and dental treatment of oral diseases can result in an infection of the heart. Infections can also travel to artificial knee, hip, and shoulder joints and complicate bone marrow transplantation. Poor mouth care can also contribute to oral cancer.

Table 1. Oral Health Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Percent of children with decayed primary and permanent teeth						
2–4 years of age	--[2]	9.0	--	--	16.0[3]	12.0
6–8 years of age	--[2]	16.0	--	--	29.0[3]	22.0
15 years of age	--[2]	15.0	--	--	20.0[3]	15.0
Percent of children who have received protective sealants in permanent molar teeth:						
At age 8	--[2]	70.0	--	--	23.0[3]	70.0
At age 14	--[2]	70.0	--	--	24.0[3]	70.0
Percent of community water systems with optimally fluoridated water	17.4[4]	50.0	15.8[4]	--	--	--
Percent of the population served by water systems with optimally fluoridated water	91.2[4]	98.0	70.6[5]	--	62.0[6]	70.0
Percent of preschool, elementary, middle and senior high school aged children who have visited a dentist in the past 12 months	71.3[7]	98.0	--	--	34.0/53.0[8]	--
Percent of adults aged 18 and older who have seen a dentist in the last year	75.9[9]	85.0	71.0[10]	--	61.0[11]	70.0
Percent of high risk pregnant women who have received a dental screening	--[2]	70.0	--	--	--	--
Percent of children and adults who report brushing twice daily and flossing once daily	--[2]	85.0	--	--	--	--

Recent studies suggest that periodontal disease, an infectious disease, may present a systemic challenge for pregnant women, increasing their risk of delivering a pre-term low-birth-weight baby. More than 60% of mortality among infants without anatomic or congenital defects is attributable to preterm low birth weight. The social and economic burden associated with preterm low birth weight is enormous; about $1.5 billion was spent in the United States in 1981, with most of the money allocated to tertiary care rather than prevention.[5]

Research has also demonstrated an association between periodontal disease and an increased risk of coronary heart disease and stroke. Research has indicated that the bacteria that build up on people's teeth are also capable of creating blood clots. Studies have shown that people with periodontal disease have about twice the usual risk of dying from heart disease. Researchers have suggested that the body's reaction to the bacteria may cause harm through the long-term, low-grade infection of periodontal disease, which causes the body to produce a steady supply of potent toxins. Given lengthy exposure, these toxins could be involved in the development of diabetes and other diseases.

Unfortunately, many people consider oral health separate from their general health. But with this view can come complex, expensive, and even life-threatening emergencies. Just as poor oral health can lead to poor general health, poor general health can lead to poor oral health. More than 90% of systemic diseases have oral manifestations.[6]

Current Status and Trends

Although the prevalence of dental caries has declined dramatically among school children during the past 30 years, it remains the most common infectious disease of U.S. children. More than one-half of all children aged 6–8 and two-thirds of all 15-year-old adolescents continue to experience dental decay.[7] Sixty percent of adolescents have gum disease.[8]

Among parents reporting their children's unmet health care needs, 57% reported unmet dental needs – nearly five times the number reporting the need for eyeglasses.[9] Twice as many parents claimed unmet desires for their children's dental treatment as for their medical care.[10] Nearly one-third of the cavities in children aged 6–8 have not been repaired – a higher percentage today than ten years ago.[7] Fewer children visit a dentist before entering kindergarten today than ten years ago, despite widespread understanding that tooth decay starts before two years of age.[7]

While the overall oral health of adults is improving, dental caries, gingivitis, and periodontal disease continue to affect many adults. A national survey spanning the years 1988 to 1991 found that 94% of adults with one or more teeth had experienced decay on the enamel surfaces or crowns of their teeth, and 25% had experienced decay on the root surfaces of their teeth. Nearly half of all employed Americans between 18 and 64 years of age and more than 50% of older adults between 65 and 74 years of age had experienced gingivitis and periodontal disease.[4] Approximately 44% of elderly adults no longer have their natural teeth.[11]

Although $50.6 billion was spent for dental care in the United States in 1997, a majority of Americans don't have

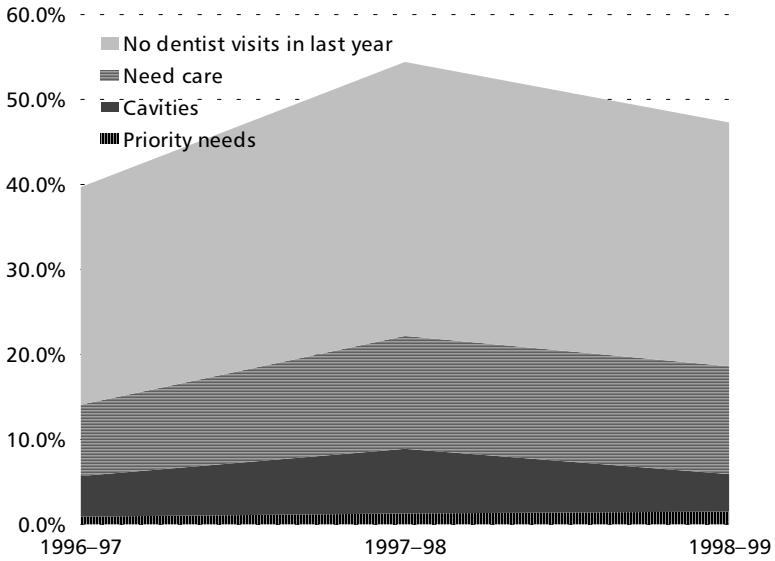

Figure 1: Percent of all Lincoln public school children with oral health needs.

dental insurance. According to the Health Care Financing Administration, 47% of dental services were paid for out-of-pocket. Only 4.4% of dental care expenditures were from public funds, with most of it (roughly 4% or $2 billion) being from Medicaid.[12]

Lack of dental insurance affects dental-care utilization and oral health status. Forty-eight percent of people without private dental insurance did not have a dental visit in the last year, compared to 28% with insurance who did not have a dental visit.[12] Even when high-risk groups have dental Medicaid, they may not receive needed dental care. More than 80% of the 21.1 million Medicaid-eligible children did not receive preventive dental services.[12]

Unfortunately, dental care is an optional service for adults in the Medicaid program. Vulnerable adult population groups have even greater difficulty accessing dental services: the homeless, homebound, elderly, minorities, uninsured, medically compromised or disabled, as well as low-income persons with HIV.

By 2008, an estimated $93 billion will have been spent on dental services.[11] However, there are proven, effective methods to reduce dental caries and disease. Community fluoridation is the single most effective and efficient means of preventing dental caries in children and adults, regardless of education and income. A 1996 study by the Centers for Disease Control and Prevention showed that for every dollar spent on fluoridating public water systems, $80 was saved in dental treatment costs. While the city of Lincoln has optimally fluoridated water, only 20% of the community water supplies in Lancaster County are fluoridated.

Children living in nonfluoridated communities frequently benefit from other fluoride sources, such as school-based fluoride rinse programs, professionally applied topical fluorides, and use of fluoridated toothpastes and mouthrinses. In Lancaster County 90% of schools in communities without an optimally fluoridated water supply participate in a school-based fluoride rinse program. However, not all of the children in these schools elect to participate in the program, nor do the school programs reach children under five years of age.

Sealants have proven to be the most effective means of preventing pit-and-fissure caries (80–90% of dental caries in children). The widespread use of sealants could have a dramatic effect on decreasing the incidence of dental caries in children. Sealants, however, are underused and public awareness of sealants is low.

Health Disparities

Almost all Americans have been affected by oral diseases; however, poor and low-income persons, members of racial and ethnic minority groups, and persons with little education are particularly at risk and experience higher disease levels.

Eighty percent of dental caries found in children are concentrated in 25% of children aged 5–17.[13] Americans for whom the burden of oral disease is greatest often have the most difficulty gaining access to the dental-care system. Low access has been correlated with low income, minority status, non-English family language, low education levels, and inner-city or rural residence. In spite of having higher documented levels of dental disease and treatment needs, members of low-income households and minority populations historically have used fewer dental services than their more affluent and nonminority counterparts. Data indicates that poor children have 37% fewer dental visits than nonpoor children.[4] Among children ages 6–8, 72% of Native-American/Alaskan Native children, 50% of Hispanic children, 34% of Black children, and 31% of all children experience untreated dental decay.[14]

Recent reports also show that dental caries are a significant health problem for U.S. preschool-aged children. An estimated 5–10% of preschool-aged children have baby bottle tooth decay, or early childhood caries, a severe form of tooth decay. The percentage is even higher in certain populations: survey results show that 20% of children from families with low incomes and 43% of children in some Native-American populations have baby bottle tooth decay/early childhood caries.[15]

Preventive oral health services and health promotion initiatives have been primarily directed towards the young. However, researchers, dental health experts, and professionals in the fields of health promotion and aging are beginning to recognize the importance of focusing attention on the oral health needs of the expanding older adult population. More older adults are keeping their teeth later in life. But, at the same time, recent studies have disclosed that the overall dental health status of older adults is not good, and that poor oral health is a barometer for general health problems in this population. For the growing proportion of American elders who do have teeth, dental and oral problems are a leading cause of discomfort, impaired quality of life, and serious (even fatal) disease among older Americans. Oral bacteria can and do initiate life-threatening diseases elsewhere in the body, such as in the lungs and heart. Fortunately, recent research has also determined that the oral health and quality of life of older adults can be maintained and improved through oral disease prevention and health promotion. The extent of tooth loss in individuals is used as a measure which reflects not only the prevalence of caries and periodontal disease, but also the availability and use of appropriate professional and community preventive services.[16]

Despite a general reduction in tooth loss in the adult population, 25% of Native-Americans and Alaska Natives aged 35 through 44 have fewer than 20 natural teeth; among those aged 55 and older, nearly 75% have fewer than 20 natural teeth.[4]

Most young adults have some degree of gingivitis. From 1988 to 1994, 48% of adults aged 35–44 had gingivitis.[4] Prevalence of gingivitis is high among Hispanics, Native-Americans, and adults with low incomes. The prevalence and severity of periodontal disease increases with age and varies by socioeconomic status. The prevalence of periodontal disease is higher than the national

average among Native-Americans and Alaska Natives, adults with less than a high school education, and migrant workers.[4]

Only about half of the people with oral or pharyngeal cancer survive more than five years. People who do survive frequently face significant functional problems, disfigurement that decreases quality of life, and an increased risk of developing new oropharyngeal cancers as well as other types of cancer. Minorities experience the worst outcomes. For example, African-Americans have a much poorer five-year survival rate for oral and pharyngeal cancer than whites (31% vs. 55%).[4] Yet, African Americans are less likely than whites to make preventative dental visits. Tobacco use, especially when combined with heavy alcohol use, is the major risk factor for more than 75% of oral and pharyngeal cancer in the United States.[17] Therefore, early detection and prompt treatment combined with the cessation of risky behaviors greatly increase the probability of long-term survival.

Public Health Infrastructure

Even when oral health is acknowledged, many consider it separate from their general health. What many people do not know is that oral health is health. The condition of the mouth reflects the condition of the body and can help dental and medical care providers identify many serious diseases. Apart from taking a thorough medical history and checking blood pressure, dentists and dental hygienists see signs in the mouth that mirror systemic conditions or diseases in the body, and given the increasing evidence that periodontal disease is a significant risk factor for pre-term pregnancy/low birth weight, cardiovascular disease, and other systemic diseases, oral health can no longer be ignored and should be considered an essential component of total health care.

Access to dentists must parallel access to physicians, and the medical and dental health care providers must collaborate more closely with patient care and risk reduction management of oral and systemic diseases.

Through a stronger collaboration of health professionals with schools and community-based programs and with greater emphasis on education, we must end misconceptions about oral health. We must raise our children to view oral health as an integral part of overall health because who we are and what we believe begins in childhood.

Medical and dental care providers will need to work collaboratively to develop essential screening protocol for the identification of risk indicators and to advocate for resources to assure high-risk population groups have access to the essential screening and treatment services.

Although we have oral health data and surveillance on a national level, state and local efforts lag far behind. If our community is to have a significant impact on identifying and eliminating oral health disparities, we must develop and implement a quality system for gathering and reporting oral health data and information.

Recommendations

- Develop and implement school and community education programs, consumer-oriented brochures, and educational materials to increase awareness of specific methods for preventing and controlling dental caries, gingivitis, periodontal disease, oral soft-tissue lesions, and cancer and for reducing risk for cardiovascular and other systemic chronic diseases. Target the educational efforts and materials to the most vulnerable or high-risk population groups, such as the low-income, the least educated, racial and ethnic minorities, immigrants, the developmentally and medically compromised or disabled, the elderly, and the uninsured. Efforts to reach these high-risk population groups should include nontraditional approaches and outreach.
- Develop and implement school-based and preschool-based dental screenings, referrals, and treatment services for high-risk children. Presently, a school-based dental screening and referral program is being implemented in the Lincoln Public Schools and the Headstart and Early Intervention programs, with high-risk children being targeted with the Mobile Health Clinic and transportation services, but the programs must be expanded to include rural and parochial schools and other preschool programs.
- Develop and implement school-based dental sealant programs for high-risk children. Target schools with high percentages of children qualifying for the Free/Reduced Meals Program. Our school-based services have been more reactive to the emergency and priority needs of our children, but we must begin to take a proactive approach with the placement of sealants for preventing tooth decay.
- Develop and implement community-based dental screenings, referrals, and treatment services for at-risk adult population groups. Preventive oral health services and health promotion initiatives have been primarily directed toward the young. Dental resources for adult services are limited and are more targeted toward addressing dental emergencies. Resources are needed for routine and regular dental care for high-risk population groups to gain adequate employability.
- Develop and implement standard screening and follow-up protocol among medical and dental health care providers for the identification of risk indicators and risk-reduction management of oral and systemic diseases. Target pregnant mothers using services through Women, Infants, and Children program (WIC) and the High-Risk Infant Program.
- Target school personnel, community leaders, and parents with educational programs that focus on the benefits of water fluoridation, the use of topical and systemic fluorides, and school-based rinse programs.

Notes

Table 1

-- Currently no data source.

1. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. Currently no data source. Could be obtained through community surveys, community screening programs, or development of a community surveillance system for the topics.

Related discussion or indicators are located in the chapters on *Tobacco Use*, and *Nutrition and Physical Activity*.

3. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1988–1994 data from the National Health and Nutrition Examination Survey.
4. Nebraska Department of Health and Human Services, Drinking Water Section, December 1999.
5. Nebraska Department of Health and Human Services, Dental Program, December 1999.
6. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1992 data from the Fluoridation Census.
7. Lincoln Public Schools, Screening Report, November 1999.
8. National Maternal and Child Oral Health Resource Center, Health Resources and Services Administration, Public Health Service, U.S. Department of Health and Human Services, in collaboration with the Children's Dental Health Project, May 1998. 34% of children aged 2–4 and 53% of children aged 12–17 had a dental visit during the past year.
9. Lincoln–Lancaster County Health Department, Behavioral Risk Factor Survey, 1999.
10. Division of Adult and Community Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System Online Prevalence Data, 1995–98. 1996 Nebraska BRFS data from tabulation query: <http://www2.cdc.gov/nccdphp/brfss/>
11. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1993 data from National Health Interview Survey.

Narrative sources

1. Nebraska Health and Human Services System, Department of Regulation and Licensure, Nebraska 1995–1996 Behavioral Risk Factor Surveillance System Report, April 1998.
2. H.C. Gift, S.T. Resisine, and D.C Larach, "The social impact of dental problems and visits," *American Journal of Public Health*, 82, December 1992, pp. 1663.
3. American Cancer Society, *Cancer Facts and Figures*, 1998.
4. U.S. Department of Health and Human Services Office of Public Health Science, *Healthy People 2010 Objectives: Draft for Public Comment*, 15 September 1998, Oral Health chapter, pp. 9–4.
5. The Colgate Oral Care Report, Periodontal/Hygiene Page, vol. 8, no. 4, 1998, pp. 4–5.
6. M. Meadows, Department of Health & Human Services, "Making Oral Health a Priority," *Closing the Gap, Newsletter of the office of Minority Health*, July 1999.
7. U.S. Department of Health and Human Services, National Center for Health Statistics, *Healthy People 2000 Review*, 1997.
8. P.F. Adams, et al., National Center for Health Statistics, U.S. Department of Health and Human Services, "Current Estimates from the National Health Interview Survey: United States," 1993.
9. G. Simpson, B. Bloom, R.A. Cohen, and P.E. Parsons, "Access to Health Care. Part 1: Children," *Vital Health Statistics*, 196, 1997, pp. 1–46.
10. C.D. Mueller, C.L. Schur, and L.C. Paramore, "Access to dental care in the United States, estimates from a 1994 survey" *Journal of the American Dental Association* 129, 1998, pp. 429–437.
11. *American Dental Association News*, 9 August 1999.
12. M. Allukian, "Dental Insurance is Essential, But Not Enough," *Closing the Gap*. Newsletter of the Office of Minority Health, Department of Health and Human Services, July 1999.
13. L.M. Kast, R.H. Selwitz, R.J. Oldakowshi, J.A. Brunell, D.M. Winn, and L.J. Brown, "Coronal Caries in the primary and permanent dentition of children and adolescents 1–17 years of age: United States, 1988–1991," *Journal of Dental Research* 75 (Special No.), 1996, pp. 631–617.
14. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics, 1997.
15. B. Briard, C. Jones, "Preventing baby bottle tooth decay: Eight-year results," *Public Health Reports* 111, 1996, pp. 63–65.
16. National Eldercare Institute on Health Promotion, U.S. Administration on Aging and the American Association of Retired Persons, *Perspectives in Health Promotion and Aging*. vol. 9, no. 1, 1994.
17. U.S. Department of Health and Human Services, Center for Disease Control and Prevention, "Improving Oral Health: Preventing Unnecessary Disease Among All Americans," At-A-Glance, 1999.

Access To Health Care

Health Objectives for the Year 2010: Improve access to comprehensive, high quality health care across a continuum of services.

Health Implications

Access to health care has long been viewed as "a given" in terms of the basic rights and privileges of the American people. However, not all Americans have had the luxury of health insurance, a family physician, or the resources available to them to obtain appropriate and timely medical care. The number of Americans without health care access was small enough in the early part of the twentieth century that it was not viewed as a significant health care issue. Beginning in the 1980s, though an ever-increasing number of Americans found themselves in the very vulnerable position of being uninsured or under-insured. "Access to health care" moved steadily to the forefront of public health issues, the lack of it preying upon our most vulnerable populations: children, pregnant women, and the elderly.

In 1996, it was estimated that 15.6% of the U.S. adult population was uninsured.[1] Similarly, the number of children lacking health care coverage was also skyrocketing, with an estimated 24% of the children in the United States without insurance coverage.[2] The same year in Nebraska at least 8% of the population were without insurance.[3]

Access to a medical "home" has significant health implications. An established relationship between a patient and physician can decrease confusion and the duplication of costly services. Introduction of preventive health screenings and continuity of care is more likely to happen in a setting of doctor-patient familiarity.

Sadly, children are significantly affected by the lack of access to health care. No or little insurance coverage means that children often are not appropriately immunized and may not obtain routine well-child exams. They are most often seen by a health care professional only when they are ill.

Access to health care in a timely and appropriate manner has significant implications for individuals' immediate and long-term health. Delaying treatment for an acute condition often leads to a more complicated and costly resolution. Furthermore, delaying routine care for chronic health ailments can significantly affect the long-term health and vitality of the individual. Inability to participate in routine health screenings (such as a prostate cancer test, mammography, pap smear, or blood pressure monitoring) may significantly delay the detection of serious health conditions, such as cancer, hypertension, and heart disease.[4] Reimbursement for routine preventive health screening has not been a regular

Table 1. Access to Health Care Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Percent of the general population 18–64 years of age with health care coverage	90.3[2]	95.0	92.1[3]	--	81.0[4]	100.0
Percent of the racial/ethnic minority population 18–64 years of age with health care coverage	69.8[5]	95.0	--	--	64.9–75.2[6]	100.0
Percent of the population with special health care needs who have access to specialty services	--[7]	95.0	--	--	--	--
Percent of the patient population who are routinely screened about major lifestyle risk factors	--[8]	80.0	--	--	56.0[9]	80.0
Percent of the population who have basic routine screening exams	--[10]	80.0	--	--	--	--
Percent of physicians, physician assistants, nurses, and other clinicians who receive appropriate training to address important health disparities, including disease prevention and health promotion, minority health, women's health, and geriatrics	--[8]	100.0	--	--	--	increase[11]
Percent of children 18 years of age and under who have a specific source of primary care	--[8]	95.0	--	--	91.0[12]	95.0
Percent of adults 18 years and older who have a specific source of ongoing primary care	70.1[13]	95.0	--	--	84.0[1]	95.0
Percent of hospital emergency departments that provide or arrange follow-up for mental health problems, including self-destructive behavior	--[8]	100.0	--	--	--	75.0
Percent of the population with mental health needs who have access to appropriate mental health services	--[8]	95.0	--	--	--	--

practice. In fact, the insurance industry has long practiced a policy emphasizing coverage for illness care over preventive care. Recent studies have suggested that screening is a significant preventive measure for most types of chronic disease. Seeking early care as well as ongoing health monitoring can significantly and positively impact the health of those with chronic disease.[5] Such practices should reduce the number of hospitalizations and emergency room visits caused by chronic health problems. A positive trickle-down effect on quality of health and life does result when health care is ongoing and good health practices are encouraged. These screening guidelines and recommendations can no longer be ignored. Screening questions and education regarding lifestyle risks are commonly overlooked in the time crunch of the office visit. An individual seeking medical help is frequently provided care for "that problem" and only that problem.

Emergency-care access for acute life-threatening situations can significantly impact the outcome of such medical emergencies. Access to emergency care includes the communities' available Emergency Medical Services (EMS) resources, transport travel time, and established, well-equipped hospitals and trauma centers. Furthermore, this accessability needs to be unencumbered by an individual's financial or insurance status and service providers' payment policies.

The issues of health care access are not limited to "the working poor." Insurance coverage, once a common employment benefit, is no longer a given because of dramatic cost increases. Many employers have changed health care coverage and plans, opting for less coverage, higher deductibles, and so forth. The average cost of insurance for a family of four is $3,000–6,000 annually. There are 6,404 business establishments located in Lincoln and Lancaster County. Seventy percent of these businesses have fewer than ten employees.[6] The number of part-time employees and temporary staff making up the work force has grown rapidly and consistently. These individuals are often ineligible for health insurance. As insurance costs have continued to climb, many employees opt to "take a chance," playing a dangerous and costly game of foregoing the purchase of health insurance. Meeting monthly financial obligations including rent, utilities, and food costs takes precedence over the purchase of health insurance coverage. They bank on the fact that they haven't had a health problem recently and anticipate that this status will simply continue, sometimes ignoring the signs and symptoms of chronic ill health.

An unmet insurance deductible, lack of a health plan, or the simple fact that a health crisis will necessitate an unplanned expense act as barriers to care. Lack of transportation, pharmacy services, necessary laboratory services, translation assistance, medical insurance or assistance, referrals to specialists as well as availability of specialists are all components of problems related to health care access.

The lack of a "health benefit" package affects the completion of appropriate treatment. Many people avoid seeking care for an acute illness (such as bronchitis) due to the cost. Often times an individual is able to pay for the office visit to the physician. A problem arises, however, if any additional interventions are needed. A patient who receives a tentative diagnosis of pneumonia may leave a clinic with instructions to obtain a chest x-ray and lab work at one location, proceed to a pharmacy at yet another location, and return to the first clinic, all before the end of the day. Obtaining an x-ray for the definitive diagnosis or purchasing one or more prescriptions is frequently beyond the individual's financial ability. Thus, appropriate implementation of the prescribed plan of care is voided due to

prohibitive costs or the fact that no benefit package exists for the patient. Whether or not these instructions are followed will significantly impact the initial course of treatment, additional care, and perhaps future health problems.

The stigma surrounding mental health continues to this day. Delays in seeking treatment and care for mental-health illnesses are common. As a crisis situation emerges, access to care is found at the emergency room. While appropriate, the crux comes at the time of discharge when follow-up and case management is most needed but often unavailable. Mental-health resource development is needed in those areas that are underserved. Lancaster County has been identified by the federal Health and Human Services agency as having a shortage of mental health care providers.[7]

Millions of Americans suffer from diseases and conditions of the oral cavity that result in needless pain and suffering, and difficulty speaking, chewing, and swallowing; loss of self-esteem; lost wages and productivity through absenteeism from work and school; and in extreme cases, death. Americans for whom the burden of oral disease is greatest often have the most difficulty gaining access to the dental-care system. Access to needed services is critical to eliminate the disparities in oral diseases that are found among members of racial and ethnic minority groups, children from low-income families, and children whose parents have less than a high school education.

Dental health care coverage through a dental insurance program is limited. Reports indicate that access to dental care is an issue of increasing prevalence, not only nationally but on a state and local level as well. Medicaid recipients have found it difficult, if not impossible, to access dental care in Lincoln and Lancaster County.

Not all is bleak however! Access to health care has improved. Actions implemented by our community as a direct result of the Healthy People 2000 objectives related to health care access included the development of a volunteer physician network, the MAC (Medicaid Access to Care) program, Access Medicaid, Kids Connection, and the purchase and implementation of services provided with the Mobile Health Clinic. Nevertheless, barriers to health care access persist. These include access to health services, pharmacy services, radiological exams, and translation and transportation services.

Those at risk for health problems ranging from diabetes to hypertension to cancer in all population subgroups need to be identified. Further, being able to determine if these at-risk populations are currently being screened for disease sets in motion a planned agenda for early diagnosis and intervention through screening in a variety of clinical settings.

Current Status and Trends

The issue of access to health care emerged in the 1980s, becoming a public health issue during the next decade. As a result of this rather recent trend in access to care, the amount of data available has been sparse. A major emphasis needs to be placed on data collection related to access to health care. Standardization of the tracking and reporting of data is vital to the long-term health of the public.

Those most likely to lack access to health care are single heads of households (predominately female) with children under the age of five years, children, single adults under the age

Among adults 18 to 64 years of age:

7%	were unable to see a doctor when needed during the past year, due to cost.
31%	had not visited a doctor for routine checkup within the past year.
30%	did not have a source of ongoing primary care.
10%	did not have health insurance or health care coverage of any kind.

Among those adults without health insurance:

28%	were unable to see a doctor in the past year due to cost, and
47.2%	had not visited a doctor for a routine checkup within the past year.

List 1: Health care access among adults 18 to 64 years of age in Lancaster County, 1999.[1]

of 65, women, and those belonging to an ethnic or minority group including African Americans, Native Americans, Latino/Hispanics, and Asian/Pacific Islanders. The number of female single heads of households with dependent children more than doubled between 1970 and 1990.[8,9]

Changes within our community that have had an impact on health care include the merger of two hospitals, the emergence of independent outpatient surgical centers, the implementation of legislatively mandated Medicaid Managed Care as well as the penetration of managed care to the population at large. The change in management of physician practices from that of an independent nature to ownership by businesses and insurance corporations has evolved. An additional issue is the availability of primary care physicians within the city. There are 481 physicians in the Lincoln community. Three quarters of these are specialists, leaving 25% to provide primary care services to the entire Lincoln and Lancaster County population. Approximately 75% of the primary-care providers will see patients receiving Medicare benefits.[10]

Health Disparities

Disparity in access to care most affects young adults between the ages of 18 and 24.

Disparities in access to care related to ethnic and minority status persist. Twenty-nine percent of the ethnic minority population in Lancaster County is not covered by any kind of health plan, compared to 8.5% of the Caucasian population.[11] Cultural sensitivity affects the health care received by many individuals, particularly in those populations experiencing disparities related to their ethnic or minority status. In a 1993 survey, it was learned that the lack of English-speaking skills prevents approximately 23% of the population from receiving health care services. This is significant to the Lincoln area, as Lincoln is the largest resettlement site in Nebraska for refugees. Lancaster County is among the top three counties in the state with the highest percentage's of population made up of minorities.[1] An issue brought to light by these population changes is the need for competent translation services in the community. This includes not only the need for accurate translation from foreign languages to English but also the return of information to patients from English to their languages. Translators need to know medical terminology to enhance the communication between the medical professional and the patient.

Chronic diseases significantly impact the health status of ethnic and minority populations. While being at significant risk for chronic diseases such as diabetes, coronary heart disease, and various forms of cancer, these populations are least likely to have access to health care or be aware of the need for screenings. Awareness, understanding, identification, and adoption of preventive health screenings for these populations most at

risk is vital. Education of medical professionals from the student to the practitioner in the community is imperative. Only through a concerted effort will we be able to reach those vulnerable populations with early detection, intervention, and treatment, thus improving the health status of millions of Americans, Nebraskans, and Lincolnites. Education on cultural sensitivity to health care providers must continue and be incorporated into all aspects of educational programs. Recruitment of medical-school candidates from a variety of cultures can enhance the medical profession in terms of education, information, and the practice of cultural sensitivity.

Whether one is enhancing the knowledge of professionals on issues related to cultural sensitivity, access to health care, disparities related to health care, or the incorporation of screening mechanisms to detect disease states early on, education is the key. Furthermore, education of consumers is crucial, for in this regard they become active participants in determining their health-care status, choices, and options.

In summary:

- The racial/ethnic minority population is 3.5 times more likely not to be covered by any kind of health plan (29%) than the white population (8.5%).
- In 1996,17.2% of the racial/ethnic minority population reported not accessing care in the prior year because of cost vs. 8.5% of the white population reporting the same.
- Native Americans were most likely to report that they needed to see a doctor but could not see one because of cost (31.6%).
- Of the population surveyed, 23% reported that their lack of English-speaking skills prevented them from receiving health care services.[11]

Public Health Infrastructure

Program Development

Existing service types that have met with success, such as the MAC program, Medicaid Managed Care, and Indigent Care, need to be expanded. New methods of delivering health care need to be considered such as providing care within neighborhoods. To achieve success, it is imperative that consumers be consulted. Identifying key members of the community to provide input, (on the type, location, hours of service delivery, and so forth) and be involved in the process is crucial. Open communication between those lacking access to health care and those trying to eliminate the disparities related to health care access is vital. Assessment of existing data, data collection resources, and future needs must be identified. Establishment of baseline data in many areas is needed. These include:

- the proportion of patients in a medical practice who are routinely screened for major lifestyle risk factors, including diet, tobacco use, alcohol or drug use, exercise, sexual practices, contraception use;
- the number of individuals in the general population who have basic routine screening exams (including blood pressure, blood sugar, mammogram, prostate, and pap smear); and
- the proportion of children 18 years of age and under who have a specific source of primary care.

Educational programs targeting consumers as well as providers on the subjects of cultural sensitivity, screening programs, and health disparities must be expanded. The number of programs directed at educating the general population regarding mental health problems should also be increased.

Recommendations

- Conduct the Minority Behavioral Risk Factor Survey (MBRFS) every three years.
- Train health professionals to address disparities. Medical education facilities will require their staff to receive ongoing education on health disparities, focusing on the areas of disease prevention, health promotion, minority health, women's health, and geriatrics. In addition, a mandatory curriculum focused on cultural competence should be established for all medical students (including, but not limited to, those who will become physicians, physician assistants, nurses, nurse practitioners, lab technicians, physical therapists, occupational therapists, speech therapists, and audiologists). Recruitment of candidates from a variety of cultures can enhance the medical profession in terms of cultural information, education, and sensitivity.
- Collect data about and assess the reasons for late entry to prenatal care.
- Assess the proportion of Lincoln Lancaster County residents who do not have access to a source of primary care. Analyze the findings and recommend strategies to increase access to primary care.
- Collect data to identify neighborhood health care needs and income level.
- Develop, promote, and increase the use of neighborhood-based clinics for well-child care, adolescent care, primary care, mental health services, prenatal care, parent education, prevention education, and dental care.
- Convene a task force to study dental-care access.
- Conduct a mental health survey of all youth and adults.
- Increase the number of competent bilingual staff in health care settings.
- Publish and distribute newsletters related to health issues in different languages.
- Develop public education spots in other languages for cable-access television (and radio).
- Develop a Quality Management Monitoring Program for outpatient surgical centers, wound centers, dialysis centers, and other outpatient medical care facilities for the purpose of assuring quality of services to all.
- Develop a community plan to address language translation resources for improving access to health care.
- Develop a community transportation advisory committee to study the impact of transportation on access to care.

Notes

Related discussion or indicators are located in the chapters on *Maternal and Child Health*, *Oral Health*, *Nutrition and Physical Activity*, and *Immunization and Communicable Disease*.

Table 1

-- Currently no data source.

1. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. Lincoln–Lancaster County Health Dept., Behavioral Risk Factor Survey, 1999.
3. Nebraska Health and Human Services, Nebraska Behavioral Risk Factor Surveillance System Report, 1995–96.
4. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1996 data from National Medical Expenditure Panel Survey.
5. Lincoln–Lancaster County Health Dept., Minority Behavioral Risk Factor Survey, 1994.
6. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1996 data for African-American (75.2%) and Hispanic (64.9%) populations.
7. Currently no data source. Populations with "special health care needs" should include children, pregnant women, the geriatric population, and persons with disabilities.
8. Currently no data source. Could be measured through a community survey tool.
9. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1994 data from National Health Interview Survey.
10. Can probably be calculated from BRFS data. "Basic screening exams" should include regular screening exams for blood pressure, blood sugar, mammogram, prostate exam, and pap smear test.
11. National developmental objective is to increase medical personnel training to address health disparities; currently no data source.
12. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1995 data from National Health Interview Survey.
13. Behavioral Risk Factor Survey data, 1999. Emergency rooms are not included as an appropriate source of primary care.

List 1

1. Behavioral Risk Factor Survey data, 1999.

Narrative sources

1. Nebraska Health Information Project 1997 Databook.
2. U.S. Bureau of the Census, March 1998, 1997, 1996 current population survey.
3. Nebraska Health and Human Services System, Behavioral Risk Factor Survey, 1995–96.
4. C. Hafner-Eaton, "Physician utilization disparities between the uninsured and insured," *JAMA* 269, 1993, pp. 787–92.
5. Nebraska Diabetes State Plan 1997–2000, pp. 9–11.
6. Nebraska Department of Economic Development, 1996 data.
7. Nebraska Health Data Report.
8. Special Public Health Report, an Update, Women's Health in Lancaster County.
9. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People Draft 2010 Objectives*, September 1998. MEPS data.
10. Lancaster County Medical Society, September 1999.
11. Lincoln–Lancaster County Health Department, Minority Health Survey in Lincoln, Nebraska, 1994.

Safe Food

Health Objectives for the Year 2010: Reduce the incidence of foodborne illness and assure the public is provided safe wholesome food.

Health Implications

Major changes in the food system, including a growing at-risk population; declining safe food- preparation practices, an increasingly diverse industry and global food supply, newly emerging pathogens; and changes in the consumer lifestyles are placing Americans at greater risk of foodborne illness.[1] Some of the pathogens of greatest concern today (e.g., *Campylobacter jejuni*, *Escherichia coli 0157:H7*, *Listeria monocytogenes*, *Cyclospora cayetanensis*) were not recognized as foodborne illnesses in the 1970s.

Foodborne illness can occur in people of all ages, but it is of special concern in the very young, immunocompromised, and older populations. Infants and toddlers are highly susceptible to dehydration caused by foodborne illness. For immunocompromised and older populations, especially those with underlying chronic health conditions, foodborne diseases can be life-threatening. The number of elderly and immunocompromised people who are at greater risk is increasing.

In milder forms, foodborne illness symptoms can include vomiting, fever, cramps and/or diarrhea which may last for several hours. In more virulent forms, such as botulism, infection by Escherichia coli 0157:H7 or Listeria, or chemical poisoning, foodborne disease can be fatal.

Three categories of hazards are responsible for foodborne illness, commonly referred to as "food poisoning" by both the public and the medical community: biological (i.e., bacteria, viruses, parasites); chemical (pesticides, cleaners, heavy metals); and physical (hair, glass, metal particles).[1]

Biological hazards pose the greatest threat to food safety and compose the vast majority of reported foodborne illnesses. Biological hazards can be subdivided into foodborne infections and foodborne intoxications.

A foodborne *infection* is an illness that results from eating food that contains harmful live microorganisms, which then often grow and reproduce in the human intestinal system. Common examples of bacterial foodborne infections are *Escherichia coli 0157:H7*, *Salmonella*, *Campylobacter*, and *Listeria*. Parasitic microbes are *Giardia* and *Cryptosporidium*. Hepatitis A and the Norwalk virus cause viral infections.

A foodborne intoxication (poisoning) is an illness that results from eating food that contains poisons or toxins. Illness may result from natural toxins

Table 1. Safe Food Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Foodborne illness incidence per 100,000 population						
Incidence of Salmonella	14.9/12.8[2]	7.0	11.5[3]	--	13.8[4]	6.9
Incidence of Campylobacter	11.9/17.6[2]	9.0	20.2[3]	--	23.0[4]	11.5
Safe food handling by adult consumers						
Percent who wash hands before preparing food	--[5]	95.0	--	--	--	--
Percent who wash hands after touching raw meat or poultry	--[5]	95.0		--	77.0[6]	87.0
Percent who wash cutting board or use a different cutting board after cutting raw meat or poultry	--[5]	91.0	--	--	81.0[6]	91.0
Percent who cook hamburgers thoroughly	--[5]	90.0	--	--	80.0[6]	90.0
Percent who refrigerate leftover food promptly	--[5]	94.0	--	--	89.0[6]	94.0
Safe food handling at food establishments as measured at regular inspection visits[7]						
Percent of food establishments with "Critical Item" violation(s)	70.1[8]	50.0	--[9]	--	--	--
Average number of critical item violations	1.1[8]	<1.0	2.0[10]	--	--	--
Percent of food establishments with temperature violation(s)	--[11]	10.0	--[9]	--	--	--
Percent of food establishments with personal hygiene violation(s)	--[11]	25.0	--[9]	--	--	--
Average number of total violations per regular inspection	8.3[8]	7.0	8.0[10]	--	--	--
Average number of "Notice of Violation" & "Food Enforcement Notices" given for violation of Food Handler/Manager Permit requirements per 1000 regular inspections	20/7[12]	10/3	--[9]	--	--	--

found in certain plant leaves, roots, fruits, grains, mushrooms, or fish. Disease can also result from the ingestion of foods contaminated with microorganisms that produce toxins. Common sources of foodborne toxins are *Escherichia coli 0157:H7*, *Staphylococcus aureus*, *Clostridium botulinum*, and *Bacillus cereus*.

Basic preventive measures are encouraged by LLCHD through inspections and educational efforts, thereby reducing the likelihood of foodborne illness from biological hazards. Basic preventive measures include using food only from approved sources; good personal hygiene; preventing cross contamination; and the proper heating, cooling, thawing, and storing of food.

Although less common, chemical hazards arise from the improper use of pesticides, cleaning chemicals, additives, preservatives (e.g., sulfites and Monosodium Glutamate), and heavy metals. Of course, chemical and metal products should be used only as specified on the label and only for intended purposes.

Physical hazards may arise from faulty or deteriorating utensils and equipment or from improperly inspected incoming food items in a food establishment. Physical hazards can come from poor food handling practice if the food handlers are wearing jewelry, false fingernails, chipping fingernail polish, or adhesive bandages.

A key to the prevention of illness in food establishments is a sound inspection and education program that identifies the "critical items" most closely associated with foodborne illness.

A strong public education program can bolster protection of the public health through safe food handling procedures used at home, private parties, nonprofit gatherings, and many volunteer-run food-service operations. Consumer education activities should include culturally sensitive material relevant to all groups of people, including members of various ethnic groups and individuals with increased susceptibility to foodborne illness.[2]

Current Status and Trends

On January 25, 1997, President Clinton announced a Food Safety Initiative (FSI) with the single mission "to reduce the incidence of foodborne illness to the greatest extent possible." Major changes in the food system and consumer lifestyles were placing Americans at greater risk of foodborne illness; therefore, the FSI acknowledges that these changes present increasing challenges to the nation's food-safety system. The federal government's food safety agencies, the Food and Drug Administration (FDA), the Centers for Disease Control (CDC), U.S. Department of Agriculture (USDA), and U.S. Environmental Protection Agency (EPA), are working together on the FSI.

The FDA sets and enforces standards for composition, quality, nutrition, labeling, additives, sanitation, and safety of foods sold in interstate commerce, except for meat, eggs, and poultry. The CDC is not a regulatory agency, but it works with regulatory agencies during outbreak investigations to determine the origins of contaminated food and the reasons for the outbreak.

In 1993 the FDA implemented a new model food code, which has been updated biennially. Requests for changes in the FDA code come from both regulators and the food industry and are reviewed at the Conference for Food Protection.

In 1997 Nebraska adopted the 1995 FDA model food code with some modifications. Revisions to the State Food Code were adopted in 1999. The

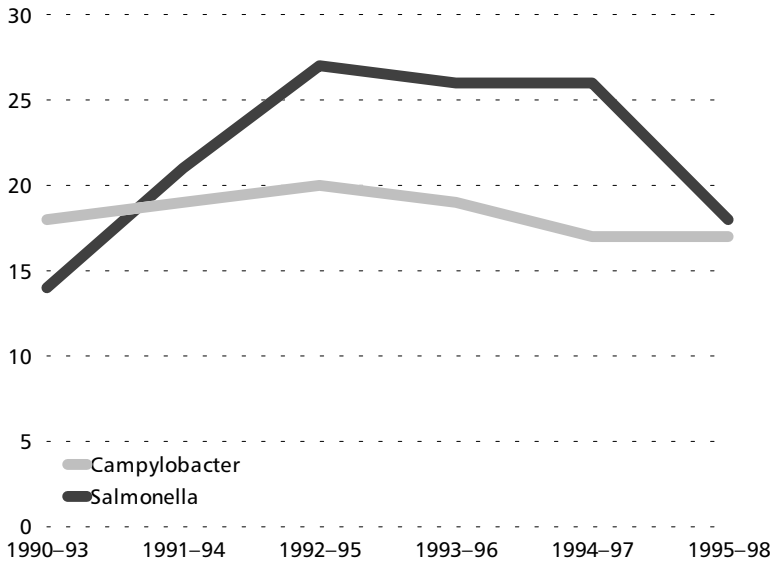

Figure 1: Incidence of Campylobacter and Salmonella in Nebraska and Lancaster County.

Lincoln Food Code adopts the State Food Code by reference.

The USDA regulates the slaughtering of animals and processing of meats (except seafood) as well as the quality of perishable agricultural commodities. The EPA registers pesticides for use on food products, sets acceptable limits for pesticide residues, and registers sanitizing agents.

Federal regulation is primarily aimed at food processing and interstate transport. State departments of health or agriculture, or local health departments, have primary responsibility for inspecting and providing educational services to food establishments.

LLCHD has local authority within the three-mile limit of Lincoln for its food-establishment permitting and inspection program. LLCHD requires permitting of all food managers and handlers. All employees in a Lincoln food establishment must have either a food manager or food handler permit. Every establishment must employ at least one permitted food manager. The food handler permitting program has evolved over the years to include training and testing for five levels of permits.

LLCHD Environmental Health Specialists (who make inspections) assure that any critical-item violation at a food establishment is quickly corrected. They provide on-the-spot education for the operator regarding the seriousness of the violation and the importance of preventing any reoccurrence.

Locally, consumer education in safe food preparation and handling is an activity of University of Nebraska and Lancaster County Cooperative Extension personnel, with the support of LLCHD.

Nationally the trend is toward increasing diversity in the food industry, which is characterized by a large, highly diverse population of employees; a high rate of employee turnover; language and literacy barriers; and nonuniform systems among the states for training and certifying workers.[3]

Due to the extremely low unemployment rate in Lincoln, the local food-service industry continues to have difficulty finding and keeping employees. Turnover of staff not only stresses the remaining staff, it creates a training and public health issue as new employees are hired and quickly put to work. Establishments that take the time to assure proper training and competency have a large investment in their workers and they realize that providing safe food is essential. Local code requires a food-service employee to get a food handler's permit within the first 30 days of work. However, additional training and oversight by the person in charge of the food establishment is critical in preventing foodborne illness.

A local trend is toward more and expanding "farmer's markets." In Nebraska a produce farmer can sell fresh produce without a permit. The farmer's markets have also traditionally included "homemade" products, such as nonpotentially hazardous baked goods. But farmer's markets are expanding in number, size, and the diversity of products sold. This creates an ever-changing situation which needs monitoring to keep up with the changes as they appear. Lincoln restricts the food products sold to "nonpotentially hazardous foods" approved by the depart-

ment, unless the product is commercially produced in a permitted facility. Regular inspections at the markets and required food-vendor training both serve to increase the safety of these homemade products served to the public.

Another trend in food service is the increasing number of temporary food stands at more frequent events and festivals, which creates additional food safety and sanitation concerns. These temporary food establishments can prepare food on site and they often serve large numbers of people in a very short time period. Hot and cold food holding, proper cooking, hand washing, fly control, general sanitation and employee hygiene and health are all important issues that must be monitored at these short-term events.

The CDC estimates that each year there are 76 million cases of foodborne illnesses in the United states, 13.8 million from known pathogens. An estimated 325,000 hospitalizations and 5,020 deaths annually are attributed to foodborne illness.[4]

Four bacteria – *Salmonella*, *Campylobacter*, *Escherichia coli 0157:H7*, and *Listeria* – are considered the most important known causes of foodborne disease in the United States.

LLCHD has investigated several large foodborne illness outbreaks over the past five years. LLCHD forms an "Epi Team" to investigate and work through the events of an outbreak as soon as one is identified. In Lancaster County the LLCHD epidemiological surveillance and investigation of foodborne illness are done by the Epi Team, including the Health Director, Environmental Health Food Team, the Epidemiologist, Public Health Nursing staff and Health Promotion and Outreach representatives. The following are a few of the investigations the Epi Team has worked on over the past five years.

In May 1995, 169 people developed *Salmonella* gastroenteritis from barbecued pork prepared by an unlicensed, out-of-county caterer. The cause of this outbreak was improper cooking temperatures, improper cooling, and insufficient reheating of frozen packaged pork. This pork was sold to hosts of 13 wedding and graduation parties, two of which were in Lancaster County.

In December 1995 *Bacillus cereus* and the toxins it produced caused a foodborne outbreak at a manufacturing company's catered Christmas party. Approximately 100 of the 240 employees reported that they became ill. Both the fried chicken and roast beef were implicated by the statistical analysis and then confirmed through laboratory testing of the leftover food. Inadequate cooking or improper holding temperatures were implicated.

In January 1997 a banquet attended by 205 people reported a number of people ill. Lab results of tested leftover food confirmed that the roast beef was contaminated with *Clostridium perfringens*. The food establishment used an improper cooling procedure, allowing the growth of this pathogen.

In September 1997 Giardia was confirmed by laboratory analysis to have caused an outbreak affecting 181 out of 267 UNL marching band members who had consumed ice water from large insulated containers. One or more students who were ill with Giardia contaminated the water by dipping used cups directly into the coolers. The contaminated water then spread the organism.

In June of 1999 over 100 people became ill following a catered retirement party at the State Capitol. Nebraska State Health and Human Services determined that the cause was the foodborne calici (Norwalk) virus.

In October 1999, *Staphylococcus enterotoxin* caused a foodborne outbreak in two separate day-care facilities that had the pizza delivered for lunch.

	Total illnesses	Total hospital	Total deaths
Salmonella	9.7%	26.4%	30.7%
Listeria	0%	3.8%	27.6%
Toxoplasma	0.8%	4.1%	20.7%
Norwalk-like Virus	66.6%	32.9%	6.9%
Campylobacter	14.2%	17.3%	5.5%
E.coli 0157:H7	0.5%	3.0%	2.9%

Table 2: CDC's estimatation of total foodborne illnesses, hospitalizations, and deaths.

Seven adults and two children had diarrhea and nausea within two hours of eating their lunch. The illnesses were reported to LLCHD and the cause was confirmed through laboratory testing of the leftover pizza.

Success in reducing the incidence of foodborne illness is difficult, owing to the change in epidemiology of foodborne diseases, increased demand for fresh foods year round, and the appearance of emerging pathogens in new products.[5] In addition, changes in the current surveillance systems may modify the resulting incidence rate. For example, if the identification and reporting of a certain infection is improved, its' numbers may increase. However, the majority of foodborne illness is viral and often not easily confirmed by current laboratory testing. It therefore remains unidentified.

The costs of foodborne illness, including medical care and lost productivity, are staggering. The USDA estimates that the medical costs and productivity losses for seven specific foodborne pathogens range between $6.5 billion and $34.9 billion annually. Total costs for all foodborne illnesses are likely to be much higher. Furthermore, this estimate does not include the total burden placed on society by the chronic illness caused by some foodborne pathogens.[6] Loss of business and lawsuits are the major cost factors, but loss of income for victims and infected food handlers is considerable. The costs of foodborne illness impact society directly or indirectly every day.

As the year 2010 approaches, traditional agents of foodborne illness are expected to continue posing considerable health risk. In response to this concern, the food-processing industry and the FDA are taking steps to reduce foodborne illness. For example, in the 1990s poultry processing came under increased scrutiny since it was estimated that 10% of all foodborne disease (primarily *Campylobacter* and *Salmonella*) was associated with poultry consumption. Poultry processing procedures have been modified to reduce contamination of the meats and the rates of *Salmonella* and *Campylobacter* have subsequently been declining in the 1990s. Although the use of irradiation as a method to reduce the numbers of bacteria on poultry was approved by the FDA in May 1990 and has industry support, it has yet to be accepted by consumers. Acceptance of irradiation in food processing should significantly reduce the likelihood of disease transmission.

As the dietary habits of the public change, most likely so will the agents of foodborne illness. For example, there has been an increase in the variety and quantity of fresh fruits and vegetables demanded, many of them imported. At the same time, the traditional meal prepared from raw ingredients and served at home is much less common today than in the past. Demand is moving to restaurant, takeout, and convenience foods, such as microwaveable and frozen foods.

Health Disparities

Within some ethnic communities, there are traditional foods and preparation processes that increase the likelihood of possible foodborne illness. Underreporting of illnesses due to factors such as access to health care may occur. Thus the effect of traditional ethnic foods and food preparation techniques on foodborne illness rates is difficult to evaluate. Often when people come from an area where refrigeration is not commonly available or used, it is thought to be unnecessary or just not considered.

Some foods not common in the United States must be studied to determine potential health risks. An example is *Balut* eggs, sold in some Asian markets. These are incubated eggs that are removed from incubation a few days before hatching and then maintained at room temperature.

Restaurants and grocery stores specializing in ethnic foods are increasing. These establishments are patronized both by members of their own ethnic community and an increasing number of nonminority customers who enjoy a diversity of foods. Most of the food sold in such stores is imported.

Nationally there has been a significant increase in the number of foods imported into the United States. Trade agreements such as North American Free Trade Agreement (NAFTA) have further enhanced this trend. However the present resources for inspection and sampling of the imported foods has not kept up with demand. The probability is then higher that the imported food has been processed in a way that is not equal to United States' standards. Because a majority of this food is consumed by racial and ethnic minorities, this trend could cause an increased probability for foodborne illness in certain communities. Some examples of ways imported food can be substandard include lead seams in canned goods, improper storage temperatures during food processing and transportation, and lead in candy from Mexico. The FDA and U.S. Customs are increasing efforts to improve inspections of facilities that export food to the United States and inspections of imported foods at ports of entry.

Current demand for employees in the food industry provides a significant employment opportunity for newly immigrated peoples. Training newly immigrated food handlers can be challenging not only because of language differences, but in also changing already known food-handling practices that were commonly accepted in immigrants' homelands, or in their homes, but are not acceptable in food establishments under the Food Code.

Public Health Infrastructure

LLCHD's Food Program provides inspection, technical assistance, and educational activities in Lancaster County. Community input on the program is provided by the Food Advisory Committee, compsed of both industry and citizen representatives. All inspectional statistics and permitting information is maintained by either LLCHD or the Nebraska State Department of Agriculture. Complaint and foodborne illness report data are kept by LLCHD.

Epidemiological surveillance and investigations of foodborne illnesses are

performed by the LLCHD Epi Team including the Health Director, Environmental Health Food Team, the Epidemiologist, Public Health Nursing Staff, and Health Promotion and Outreach representatives. Food is regulated by federal, state, and local agencies. The regulations are revised on a regular basis – generally every two years – to keep current. LLCHD policies and procedures will be maintained to assure adherence to policies reviewed by the local Food Advisory Committee and approved by the Board of Health. A community survey should be completed to provide data on the indicators selected.

Recommendations

- Continue the inspection of all food establishments and food facilities according to applicable codes (retail stores, processors, and warehouses). Emphasize critical items.
- Implement an electronic inspection system.
- Promote ongoing education of food establishment management on proper food sanitation and safety practices.
- Continue to require food manager and food handler education and testing as well as providing ongoing seminars and printed information.
- Expand food handler/manager education and permitting requirements to include farmer's markets, temporary food establishments, and event/festival markets.
- Expand consumer education on food safety issues in cooperation with the state and Lancaster County Extension Services.
- Develop a foodborne disease surveillance program and establish a medical committee to address foodborne disease.
- Maintain a proactive group of industry and public representatives to address current food protection problems.
- Research the feasibility of a chemical and biological monitoring program (random sampling).
- Promote chemical use awareness.
- Continue the "Hazard Analysis Critical Control Point" (HACCP) approach, focusing on menu items that epidemiological evidence has shown are most likely to cause foodborne disease if mishandling occurs.
- Provide consultative visits annually to high-risk establishments ("high risk being determined by the type of foods prepared or the history of the food establishment").
- Mandate food-handler permits for childcare providers.
- Assure regular routine inspections of nursing homes and residential care facilities.
- Promptly investigate all reported cases of foodborne illness and activate the epidemiological response team as necessary.
- Develop a random food sampling program especially focused on imported foods.
- Implement risk-based inspections.
- Educate emergency room doctors and care providers on foodborne illness and the importance of testing and reporting.

Notes

Related discussion or indicators are located in the chapters on *Public Health Emergency Management*, and *Immunization and Communicable Disease*.

Table 1

-- Currently no data available.

1. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. Lincoln Lancaster County Health Department, Communicable Disease and Epi sections. Incidence rates are shown for both 1998 alone and for the three year period of 1996-1998 (14.9 for salmonella and 11.9 for Campylobacter (11.9/100,000).
3. Nebraska Health and Human Services System, Public Health Assurance, Communicable Diseases Section. 1998 data provided by program staff.
4. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. Preliminary 1997 data from active surveillance at FoodNet sites.
5. Currently no data available. Could be obtained through a community survey.
6. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1998 data from the Food Safety Survey (FSS), FDA, planned for use every two to three years.
7. Common data source for local and state data on safe food handling at Food Establishments: Nebraska Department of Agriculture (NDA) data on Food Service (restaurant) facilities ("01" classification only).
8. Lincoln–Lancaster County Health Department. LLCHD analysis of NDA data on Food Service facilities inspected July 1, 1998 to June 30, 1999.
9. Currently no data available, but probably obtainable from NDA, Food Inspections section.
10. NDA, Food Inspections section.
11. Data is available, but tabulations are under development. Data will come from LLCHD analysis of raw NDA data on Food Service facilities inspected from July 1, 1998 to June 30, 1999. Food temperature violations are defined with codes: 81-2272.15, 3-401.11, 81-2272.16, 3-402.11, 3-403.11, 81-2272.19, 81-2272.20, 81-2272.21, 81-2272.22, 81-2272.23, 81-2272.26. Personal Hygiene Violations are defined with codes: 2-301.11, 81-2272.08, 2-302.11, 2-303.11, 2-304.11, 2-401.11, 81-2272.11, 3-301.12, 81-2272.10.
12. Lincoln–Lancaster County Health Department. LLCHD analysis of NDA data on Food Service facilities inspected July 1, 1998 to June 30, 1999. Average number of "Notice of Violation" and "Food Enforcement Notices" given for violation of Food Handler (average of 20 notices) and Food Manager (average of 7 notices) permit requirements, per 1000 regular inspections.

Table 2

1. Paul S. Mead, Laurence Slutsker, Vance Dietz, Linda F. McCaig, Joseph S. Bresee, Craig Shapiro, Patricia M. Griffin, and Robert V. Tauxe, Centers for Disease Control and Prevention, "Emerging Infectious Diseases: Food Related Illness and Death in the United States."

Narrative sources

1. The Educational Foundation, *Applied Foodservice Sanitation – A Certification Coursebook*, 1995.
2. Washington State Department of Health, Environmental Health Indicators, 1998.
3. Food and Drug Administration, *Healthy People 2000 Progress Review*, 1995.
4. Paul S. Mead, Laurence Slutsker, Vance Dietz, Linda F. McCaig, Joseph S. Bresee, Craig Shapiro, Patricia M. Griffin, and Robert V. Tauxe, Centers for Disease Control and Prevention, "Emerging Infectious Diseases: Food Related Illness and Death in the United States."
5. Public Health Service, *Healthy People 2000 Progress Report for Food and Drug Safety*.
6. <www.cdc.gov/ncidod/foodsafe/report.htm#foodborne>

Water Management

Health Objectives for the Year 2010: Prevent public exposure to waterborne chemical and biological agents that are known to cause death, disease, and reduction in quality of life.

Health Implications

We must have water to live, thus we must either protect out water from contamination or spend considerable resources in an attempt to make it safe for our use. This section addresses several topic areas that all impact public health through the use and association with water.

Safe Water

Safe uncontaminated water is of utmost importance to the health of every person. Numerous disease-causing organisms and chemical contaminants can be transmitted via water and can have serious health effects. These contaminants may enter the water at the source, during transmission, and at the point of use.

To better protect the public health, in 1974 Congress passed the Safe Drinking Water Act, which has been revised many times over the years. This law requires the Environmental Protection Agency to determine safe levels of chemicals in drinking water that do or may cause health problems. These nonenforceable levels, based solely on possible health risks and exposure, are called Maximum Contaminant Level Goals (MCLG). Based on MCLGs, the EPA sets an enforceable standard called a Maximum Contaminant Level (MCL). MCLs are set as close to the MCLGs as possible, taking into consideration the ability of public water systems to detect and remove contaminants using suitable treatment technologies.[1]

Standards have been set for 80 contaminants that may occur in drinking water and pose a risk to human health. These 80 contaminants can be divided into two groups, according to whether the health effects they cause are acute or chronic. Acute health effects occur within hours or days of the time that a person consumes a contaminant. Although almost every contaminant could have an acute effect if consumed at extraordinarily high levels in drinking water, the contaminants are most likely to cause acute effects are microorganisms (bacteria, protozoa, and viruses). Most people's bodies can fight off these microbial contaminants, and exposure to them typically does not have permanent effects. Nonetheless, they can make people ill, and can be dangerous or deadly for a person whose immune system is already weak due to HIV/AIDS, chemotherapy, steroid use, or another reason.

Table 1. Water Management Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective
Number of violations of Safe Drinking Water Act (SDWA) by Lincoln Water System (annual)[1]	0.0[2]	Maint.	--	--	--	--
Number of violation of SDWA by other public water suppliers	34.0[3]	0.0	87.0[3]	--	--	--
Level of trihalomethanes (ppb)	29.2[4]	Maint. <40.0	--	<60.0[5]	--	<60.0[5]
Percent of citizens informed about contaminants in their public water supplies	--[6]	100.0	--	--	--	--
Percent of people able to identify common contaminant in public water supplies, health impact and how to reduce exposure	--[6]	50.0	--	--	--	--
Percent of buildings/structures with backflow protection between public water supplies and their users	--[7]	100.0	--	--	--	--
Percent of buildings/structures with backflow protection between building water system and internal potential contaminate sources.	--[7]	95.0	--	--	--	--
Percent of people able to identify common contaminant in private well water, health impact and how to reduce exposure	--[6]	100.0	--	--	--	--
Percent of private well water users testing annually for bacteria and nitrate levels	--[8]	50.0	--	--	--	--
Number of waterborne illness outbreaks from community water supplies	0.0[9]	0.0	--	--	--	2/year[10]
Proportionate growth rate between city and county	9:1[11]	Maint.	--	--	--	--
Percent of newly constructed onsite sewage treatment systems inspected and approved	95.0[12]	100.0	--	--	--	--
Percent of construction areas which meet building code requirements for storm water run off protection	--[13]	100.0	--[13]	--	--	--

Maint.=Maintain attainment

Chronic health effects can occur after people consume a contaminant, even at low levels above EPA's MCL safety standards, for many years. The drinking water contaminants that can have chronic health effects are chemicals (such as solvents, pesticides, and disinfection by-products), radionuclides (such as radium), and minerals (such as arsenic). Examples of the chronic health effects of drinking water contaminants, including disinfectant by-products (DBPs), are cancer, liver or kidney problems, birth defects, and reproductive difficulties.[2]

Land Use Planning

City growth affects multiple aspects of public health from public violence and vehicular accidents to infrastructure challenges. Unplanned growth in flood plains places citizens in physical danger during storm events, while increased population density county-wide increases demand for all community resources, including water.

Sewage Treatment

Exposure to raw or inadequately treated sewage results in many types of disease. Bacterial, protozoan, and viral diseases are directly transmitted through exposure to human waste, and indirect exposure can result when incomplete treatment returns pathogens to the environment. Poisoning may also result when inorganic wastes are returned to the environment (for example, heavy metals such as mercury, cadmium, and lead).

Sewage disposal systems can cause nitrate-nitrogen contamination of groundwater, which can cause a condition known as methemoglobinemia in infants who are fed the water.

Storm Water Management

Development of land previously used for agricultural purposes into urban/domestic and industrial property increases sediment loads and can have drastic effects on surface waters and the entire watershed. The construction process itself may degrade surface water and increase disease-causing organic and inorganic pollutants. An increased density of people and structures in previously undeveloped areas increases pollutant discharge during storm events, exposing the public to disease, or may simply exceed the storm water system's capacity, resulting in flood.

Recreational Water Usages

Contamination of surface waters exposes the people who use them, for every sort of recreational purpose imaginable, to a variety of hazards. High turbidity and sedimentation of area lakes increases the chance of drowning for people who swim, boat, and fish. Occasional high levels of coliform bacteria or parasites increase the risk of infections. Consumption of fish from water that has become contaminated with pesticides, organic chemicals or heavy metals can lead to acute and chronic health consequences.

Recreational use of swimming pools and spas exposes the user to these same categories of contamination. Biological contamination can occur from either the other bathers or due to incorrect levels of chemical sanitizer. High turbidity due to poor water chemistry and exposure to chemicals due to excessive use can create drowning risks. Both natural and human-constructed recreational waters have been shown to be the source for outbreaks of disease.

Current Status and Trends

The Safe Drinking Water Act Amendments (SDWA) of 1996 required the Center for Disease Control and EPA to work together to determine the occurrence (incidence) of waterborne disease in the United States. Other than monitoring passive surveillance systems, such research had never been done. Several studies are now underway to better define the percentage of gastroenteritis that is caused by water.[3] Another result of the 1996 amendments was the requirement for water suppliers to give their customers information on the quality of the water they provide. This information includes the source of the water, contaminants tested for and found, the health risks posed, compliance with regulations, and contact numbers for more information.[4] The Lincoln Water System (LWS) sent an annual report out in 1998 and 1999 including all required information. The LWS provides water for approximately 90% of the population in Lancaster County. The most current peak water usage figure provided by the Lincoln Water System is 75 million gallons per day, with an average production of 35 million gallons per day (167 gallons per day per person).

Disease Outbreaks – National Data

Despite the regulations adopted under the SDWA, the most recent report of waterborne disease outbreaks from CDC (covering 1995–96) reveals that 13 states reported a total of 22 outbreaks associated with drinking water, ten of which were associated with community water supplies.[5] Microorganisms such as Cryptosporidium, Giardia, E. coli 0157:H7, Shigella, and many viruses have each been implicated in serious waterborne disease outbreaks.

In 1994, an outbreak of Cryptosporidium in Milwaukee, Wisconsin, caused approximately 400,000 illnesses and 4,000 hospitalizations. The source of water for Milwaukee is surface water, which is typically much more contaminated and requires more treatment than groundwater. Another outbreak, which occurred in the late summer of 1999 in New York State, involved groundwater serving a well at a county fair. The well became contaminated with cattle manure containing E. coli 0157:H7. This second outbreak led to more than 1,000 illnesses, dozens of hospitalizations, and at least two deaths.

Disease Outbreaks – Lancaster County

More than 90% of the people residing in Lancaster County drink groundwater that is regulated under the Federal and Nebraska SDWA, including all residents of Lincoln, Hickman, Waverly, and all villages; all persons receiving water through Lancaster County Rural Water District (RWD) No. 1 and Cass County RWD No. 2; and all other residents who use "community" water supplies, such as subdivisions with a shared water system.[6] Most Lincoln and Lancaster County residents drink tap water that meets all existing health standards all the time. There has not been a confirmed outbreak of waterborne illness from a community water supply in Lancaster County in the past ten years.

For those persons relying on private wells for their drinking water, contamination with bacteria and nitrates are of highest concern. Local inspections of rural properties changing ownership have frequently found groundwater contaminated with fecal coliform bacteria and nitrate levels above what is the EPA MCL for public water supplies (10 mg/l). A study conducted in the U.S. Upper Midwest in 1994 found that 41.3% of wells sampled were contaminated with Coliform bacteria, 11.1% had E. coli specifically, and 13.4% had a nitrate-nitrogen level that exceeded the

EPA MCL.[7] In addition, private wells are not fluoridated, thus increasing the risk of dental caries for young children before they enter school and are afforded the opportunity to use fluoride-rinse programs. The Lower Platte South Natural Resources District is currently conducting a study of nitrate contamination in the Waverly area. Water quality in Lancaster County is highly variable, and many private well owners treat their water for what is referred to as "secondary" contaminants, such as iron, manganese, chloride, and hardness. These secondary contaminants do not pose health risks for most people, but may lead to unsatisfactory tastes, smells, staining of clothing or fixtures, buildups in pipes and plumbing fixtures, or loose stools.

Wellhead Protection

Natural Resources Districts (NRD's) are pivotal in groundwater management and protection of the watersheds. Groundwater Management Areas are a primary issue in this county due to a lack of abundant and good quality groundwater.[8] Groundwater management plans have been developed and implemented by the NRD's to protect this natural resource.

A wellhead protection area is the geographic area from which a well draws groundwater. This is the area where contamination can be prevented. Between 1993 and 1996, LLCHD worked with each village in Lancaster County, Lancaster County RWD No.1, and several other public water supplies (for large subdivisions, schools, and institutions) to calculate by the computer model the area each well will receive water from over the next 20 years. From this information, volunteers and LLCHD staff conducted surveys to identify potential sources of contamination of wellhead areas. LLCHD assisted teachers at each of the four rural high schools to develop a curricula and field activities for students. The students then performed water sampling and provided education to farmers, business owners, and acreage owners in the Wellhead Protection Area. Signs were erected along county roads identifying each Wellhead Protection Area. Students have also participated in "Find a Well" days, in which they go to each property within a given area to identify any wells that should be decommissioned (abandoned).[9]

Disinfection By-Products

More than 83% of Lancaster County's 240,000 people consume water that has been disinfected. Because of the large population exposed to DBPs, health risks associated with these chemicals, even if small, need to be taken seriously. Fortunately, Lincoln's water contains only low levels of the types of DBPs primarily trihalomethanes that are not generally associated with health risks.[10]

While disinfectants are effective in controlling many microorganisms, they react with natural organic and inorganic matter in source water and distribution systems to form potentially harmful DBPs. Many of these DBPs have been shown to cause cancer and reproductive and developmental (birth) effects in laboratory animals.[11] In addition, recent epidemiological, studies of human populations exposed to higher levels of DBPs have found increased risks of birth defects, spontaneous abortion (miscarriage), and low birth weights, and cancer.[12]

Land Use Planning

Land use planning has risen to the top of the public agenda. Considerable interest has been generated by development near Wilderness Park. A conference was recently sponsored by the University of Nebraska concerning productive land use for Lincoln in the twenty-first century. This conference concerned itself with sustainable development, mixed-use planning, and

economic benefits for developers, the construction industry, and property owners. New developments are reviewed by various city and county agencies for water, sewer, and storm water issues.

Sewage Treatment

Disposal is no longer an acceptable method for dealing with raw sewage. We know that nothing buried stays buried forever. Definitive treatment, which breaks the sewage down into its natural elements and returns those elements safely to the environment, is preferred. Treatment facilities for the City of Lincoln, Hickman, Waverly, the county's villages, larger businesses, and subdivisions must meet the stringent guidelines of the National Pollutant Discharge Elimination System (NPDES). Individual homes in the remainder of the county must rely upon various types and sizes of onsite sewage treatment systems. All domestic sewage treatment systems installed must be permitted and inspected.

Storm Water Management

Developers have been responsive to recommendations for no net rise in flood plain construction projects. Better methods of preventing runoff from construction sites have been developed, and the use of sediment fences and ponds are common. New regulations are proposed than will require permits for disturbing more that two acres of land and best management practices.

Recreational Water Usages

In 1995 and 1996, CDC identified 37 disease outbreaks in 17 states attributed to recreational water, including lakes, pools, and hot tubs.[13] Locally, in the summer of 1999, a childcare facility had an outbreak of E. coli 0157:H7 associated with a small wading pool and a fecal accident. Two were hospitalized, one child with hemolytic uremic syndrome.

In 1995, Lincoln experienced an outbreak of Cryptosporidium at a local swimming pool, which affected more than twenty people. Swimming pools and public spas in Lincoln are permitted and routinely inspected.

Occasionally, cases of Giardia are linked to swimming in local bodies of water. Warnings have been issued concerning the likelihood of bacterial, protozoan, and safety hazards associated with swimming in local lakes.

Work with the local minority population has identified high consumption of fish from local waters. With information available from the Nebraska Game and Parks Commission, an advisory was prepared for area lakes and streams with information indicating which fish might be contaminated and should not be relied upon as a regular food source.

Health Disparities

In general, racial and ethnic minorities are not faced with health disparities posed by water or sewage in Lancaster County. However, in 1996, the LLCHD completed an Environmental Health Hazard Risks survey in the minority community in Lincoln. One of the surprising findings was that contaminated water ranked the highest of all environmental hazard concerns. These minority Lincoln residents receive the same water as all Lincoln residents. Interactions within the minority communities led to staff concluding that either lack of trust in the government's ability to protect their health and/or lack of understanding how city water is treated lent significantly to this concern.

Perhaps the greatest disparity are the increased health risks posed to the Asian

population by significantly higher consumption of fish and reliance on fishing from local water bodies.

The perceptions of different cultures and ethnicities, in Lancaster County can affect every aspect of their water usage. In relation to pure water, one person may like the taste of well water while others prefer no taste at all in their water. It has also been observed that recent arrivals often have concerns about government credibility concerning the community water system and its safety.

Public Health Infrastructure

- Create and maintain a testing program and a data system that will allow monitoring of health indicators, such as the percentage of well–test results that do not meet SDWA limits.
- Update ordinances and policies.
- Develop and regularly conduct a public behavior and belief survey of environmental health indicators.

Recommendations

- Delineate the groundwater resources in Lancaster County by charting known aquifers and domestic wells.
- Geo-locate all domestic wells in Lancaster County.
- Continue a permitting and inspection program for newly constructed onsite sewage treatment systems.
- Permit installers of onsite sewage treatment systems and provide an educational program concerning proper installation methods and regulations.
- Continue a permitting and inspection program for newly constructed wells within Lincoln's three-mile limit.
- Promote efficient water usage as determined by LWS.
- Provide Pollution Prevention technical assistance to businesses, farms, and acreage owners in Wellhead Protection Areas.
- Educate the public that relies on private water wells of the importance of testing their water annually for bacteria and nitrates.
- Promote efficient chemical usage in city and rural situations.
- Involve water issues with land-use management planning.
- Support back-flow prevention and protection activities.
- Provide outreach to the community throuth education of youth, minorities, and professionals concerning the protection of water resources.
- Promote the best management practices to reduce the potential for contamination and soil sediment from reaching streams.
- Encourage the establishment of riparian set-asides and easements along streams and drainages.
- Encourage regular water quality testing for private drinking water supplies.
- Make information available tor recent arrivals to the city or county that outlines information about water quality.

Notes

Related indicators or discussion are located in the chapters on *Oral Health*, *Waste Management*, *Toxic and Hazardous Materials*, and *Safe Food*.

Table 1

-- Currently no data source.

1. Lincoln Water System provides water for over 90% of Lancaster County's population.
2. Lincoln Water System, 1999 (no violations).
3. LLCHD tabulations of 1999 violations data provided by Nebraska Health and Human Services System, Environmental Health Services Section, Drinking Water Program.
4. Lincoln Water System, trihalomethane levels in 1999, in parts per billion (ppb). Trihalomethanes are the most common disinfectant by-product produced by Lincoln Water System disinfection methods.
5. Safe Drinking Water Act limits set for the year 2002, in parts per billion (ppb). SDWA goals and limits are likely to change over the decade.
6. Currently no data source – data could be obtained through a community survey tool. Common contaminants would include nitrates, lead, arsenic, bacteria, and other pollutants of concern and listed in the Safe Drinking Water Act.
7. Currently no data source – however data is likely obtainable in the future from Lincoln's Building and Safety Department and the Mayor's Backflow Prevention Program.
8. Currently no data source – however data may be obtainable though a community survey or well survey project.
9. Lincoln–Lancaster County Health Department. Water and Communicable Disease Programs. No waterborne illnesses occurred in 1999, although there have been outbreaks in recent years.
10. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. Healthy People Year 2010 Objective.
11. Lincoln–Lancaster County Planning Department.
12. Lincoln–Lancaster County Health Department, Water Program. Percent of newly built water systems permitted each year which were originally built with a permit rather than discovered and permitted post-construction.
13. Currently no data source – data may be obtainable from natural resources districts.

Narrative Sources

1. Drinking Water and Health, National Primary Drinking Water Regulations, Contaminant Specific Fact Sheets for Consumers, December 1998. <www.epa.gov/OGWDW/dwhcvoc/tetrachl.html> 10/11/99.
2. US EPA, Office of Water, Office of Ground Water and Drinking Water, <www.epa.gov/safewater/dwh/health.html> 10/22/99.
3. EPA, Office of Water, Office of Ground Water and Drinking Water, <www.epa.gov/ogwdw000/standard/wborne.html>
4. *The Aquifer, Journal of the Groundwater Foundation* vol. 14, no. 2, September 1990, pp. 40.
5. MMWR Surveillance Summaries, vol. 47(SS-5), December 11, 1998, pp. 1–34.
6. Lincoln City–Lancaster County Comprehensive Plan, Lincoln–Lancaster County Planning Department, 1994.
7. A Survey of the Quality of Water Drawn from Domestic Wells in Nine Midwestern States, Centers for Disease Control and Prevention, and the National Center for Environmental Health, <www.cdc.gov/nceh/programs/emergency WaterWell/WellSummary> 10/99.
8. LPS GWMP.
9. Contaminant Source Inventory Report, Wellhead Protection Program, Lincoln–Lancaster County Health Department, Lincoln, NE, December 1993.
10. Lincoln Water System, Consumer Confidence Report, 1999.
11. Microbial and Disinfection By-product Rules, US EPA, Office of Water EPA 815-F-98-0014, December 1998.
12. P. Magnus, et al.," Water Chlorination and Birth Defects", *Epidemiology*, vol. 10, no. 5, September 1999, pp. 513–17.
13. MMWR Surveillance Summaries, vol. 47 (SS-5), December 11, 1998, pp. 1–34.

Clean Outdoor Air

Health Objectives for the Year 2010: Maintain achievement of the National Ambient Air Quality Standards in Lincoln–Lancaster County. Assess health risk posed by emissions of hazardous air pollutants from stationary, area, and mobile sources. If that risk becomes unacceptably high, reduce emissions.

Health Implications

A substantial federal regulatory program exists to assure that health risks from outdoor air pollution are minimized. The U.S. Environmental Protection Agency (EPA) delegates to state and local agencies, such as the Lincoln–Lancaster County Health Department, the responsibility to conduct many of the assurance activities associated with federal regulations, such as monitoring air quality, writing permits for new and existing air pollution sources, inspecting for compliance, inventorying air emissions, and taking enforcement action against non-compliers. With the exception of measuring the actual level of pollution in the air, these activities are, at best, secondary or tertiary measures of exposure potential, health risk, or disease caused by air pollution.

Every breath can expose individuals to a dose of air pollution which – depending on the chemical, concentration, and individual sensitivity – has the potential to cause or increase the risk of adverse health effects. These health effects include acute respiratory system or eye irritation, chronic respiratory disease or asthma, cancer, and serious chronic organ dysfunction. Epidemiological studies have demonstrated that the mortality rate due to cardiopulmonary problems is elevated in cities even with levels of airborne fine particulate matter even lower than the current ambient air quality standards. Exposure to moderate levels of ambient ozone can cause breathing changes even in healthy adults, but asthmatic children especially are at increased risk of respiratory problems from ozone. Hazardous air pollutants include many types of chemicals, exposure to which can increase the risk of cancer, adverse reproductive effects, or other organ disease. The toxicology of many of these individual hazardous air pollutants is poorly understood, although their individual effects have been documented from the high exposures seen in occupational settings. However, even more poorly understood are the cumulative effects of being exposed simultaneously to a host of pollutants, such as occurs in an urban setting.

There are indirect or potential human health risks from dirty air. Air pollution that persists in the environment, such as metals and pesticides, can deposit on water or land and accumulate through

Table 1. Clean Outdoor Air Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective[1]
Measured levels of ozone <0.12 ppm (for any one hour) and <0.08 ppm (for any eight hours)	**Att.**[2]	**Maint.**	**Att.**[3]	--	**Not Att.**[4]	**Att.** by 2012
Measured levels of carbon monoxide <35.0 ppm (for any one hour) and <9.0 ppm (for any eight hours)	**Att.**[2]	**Maint.**	**Att.**[3]	--	**Not Att.**[4]	**Att.** by 2005
Measured levels of fine particulate <65 ug/m3 (for any 24 hours) and <15.0 ug/m3 (annual)	**Att.**[2]	**Maint.**	**Att.**[3]	--	**Not Att.**[4]	**Att.** by 2017
Annual emissions of criteria air pollutants from stationary mobile and area sources remain at 2000 levels or decline (in tons)	13,977.9[5]	**Maint./Re.**	109,042.2[6]	--	390 million[7]	--
Annual emissions of hazardous pollutants from stationary, area and mobile sources remain at 2000 levels or decline (in tons)	1,322.2[5]	**Maint./Re.**	831.0[6]	--	8,100,100[8]	**Re.** 75% by 2010[9]
Cancer and non-cancer health risks from hazardous air pollutants are within acceptable risk levels[10]	--	--	--	--	--	--

Att.=Attained **Maint.**=Maintain attainment **Not Att.**=Not attained **Re.**=Reduce levels

the food chain, resulting in contaminated fish, which pose a human health risk by ingestion. Accidental releases of certain chemicals, which are sometimes stored in large quantities, such as chlorine or anhydrous ammonia, can pose a severe public health risk.

In addition to health effects on human populations, air pollution can adversely impact ecosystems and the general environment. Emissions of sulfur dioxide over time have acidified lakes in areas with soils that have poor buffering capacity, making the lakes unable to support life. Emissions of freons have accumulated in the stratosphere and deteriorated the ozone layer, which serves to deflect ionizing radiation from the sun. Finally, an increasing body of scientific evidence indicates that increasing emissions of "greenhouse gases," such as carbon dioxide, have the potential to change the earth's climate in several ways that can adversely affect human life (i.e., average temperature, rainfall, and the intensity of weather events).

Current Status and Trends

Air quality in Lincoln–Lancaster County is relatively good, based on current assessment, but some aspects need more assessment. The Clean Air Act, which LLCHD administers, currently focuses on criteria pollutants and hazardous air pollutants (HAP). Criteria pollutants are seven chemicals that are the "criteria" by which good air quality is defined, based on whether the measured concentrations of these chemicals in an area exceed national health-protective standards. National Ambient Air Quality Standards (NAAQS) have been established for carbon monoxide, particulate matter less than 10 microns in size (PM10), ozone, nitrogen oxides, sulfur dioxide, lead, and particulate matter less than 2.5 microns in size (PM2.5). Monitoring determines the amount of these pollutants in Lincoln–Lancaster County air compared to the standards.

LLCHD monitors for carbon monoxide, a pollutant which results from fuel combustion (most importantly from vehicles) continuously year round. Ozone, a pollutant that is formed in the air in the presence of sunlight from a combination of nitrogen oxides and volatile organic compounds, is monitored continuously during the ozone season, which is April 1 to October 31. LLCHD samples for PM2.5 once every third day. This pollutant comes mainly from combustion of fuel or other materials. Monitoring for PM10 was discontinued in 1998 after a decade of results indicating that the level was consistently no more than 50% of the NAAQS limit. Similarly, monitoring for nitrogen oxides and sulfur dioxide was discontinued in the late 1970s after almost a decade of results showed low levels. LLCHD does not monitor for lead because there are no significant sources in Lancaster County.

The HAP class of chemicals is a specific list of 188 pollutants, also called air toxics, which have the potential to cause cancer or other serious acute and chronic health effects. There are no health-based ambient standards for these chemicals, although there are established guideline levels that represent minimal health risk. The focus of most of the rules on toxic air pollution is to minimize emissions of these chemicals into the air with the expectation that health risk will proportionally be reduced.

Emissions of criteria pollutants and hazardous air pollutants come from industrial and business activities, fuel combustion, unpaved roads, and from automobiles, trucks, construction equipment, trains, and airplanes. Currently, 116 businesses and opera-

tions are regulated under air pollution rules in Lancaster County. In addition to regulatory activities, LLCHD actively promotes voluntary action by air pollution sources to reduce emissions through the use of pollution prevention. This approach has been successful in reducing air toxics emissions from industrial and business activities beyond what regulations require and would probably be the best way to reduce greenhouse gas emissions. Only EPA has the authority to regulate emissions from vehicles, equipment, trains, and planes by setting emission standards for different types of engines. However, a local agency can implement programs to reduce vehicle use, which results in lower emissions overall from mobile sources.

The following air quality trends have been either measured in Lincoln–Lancaster or have implications for our community:

- Lincoln–Lancaster County air quality meets national health standards – for now. LLCHD monitors the level of three criteria pollutants: carbon monoxide, ozone, and PM2.5. The measured levels of carbon monoxide and ozone continue to be below (often well below) the health protective NAAQS. Sufficient data on PM2.5 has yet to be collected to determine officially if levels exceed the standard. Across the United States, the more populated an urban area becomes, the more likely it is to have levels of criteria pollutants (particularly ozone) that exceed the NAAQS. Most metropolitan areas above 500,000 population exceed at least one NAAQS.
- The trend in stationary source emissions is level or declining. Emissions of criteria pollutants from stationary sources of air pollution have remained relatively constant over the past five years. Emissions of HAP (the 188 toxic chemicals identified in the Clean Air Act) from stationary air pollution sources have decreased 53% since 1994, mostly through voluntary pollution–prevention actions by large air-pollution sources to decrease usage of HAP-containing solvents, paints, and other chemicals.
- The national air toxics program is shifting its focus to risk reduction. Although the federal air toxics program has been focused on reducing HAP emissions through specific control standards for certain stationary source types, EPA's focus is shifting to assessing which sources contribute most to public health risk. Once those are identified, a strategy will be developed to reduce emissions based on what will reduce that risk to the greatest extent. This strategy will rely in part on assessments done at the local level and then on state and local air toxics programs to accomplish the risk reduction.
- Vehicle emissions may pose the greatest health risk, but assessment is needed. The trend in air pollution emissions from mobile sources is unknown. LLCHD will complete a mobile source inventory this year. However, a computer modeling study done by EPA indicates that levels of some HAP chemicals in Lincoln's air may significantly exceed health benchmarks. Most of the pollutants predicted to be at high levels in the study are those typically emitted by vehicles. LLCHD plans to complete a comprehensive emission inventory, which will include mobile and area sources of air toxics, and conduct its own refined analysis of health risks posed by HAPs. In areas of the country (both urban and rural) where air monitoring for HAPs has been conducted, the pollutants most frequently measured at levels of concern are the mobile source toxics. This is true even in highly industrialized urban areas.
- Cars are running cleaner, but people are driving more. Population growth in Lincoln–Lancaster County has been

about 1.1% per year. The increase in vehicle miles traveled has been about 3% per year. The more vehicle miles traveled, the more potential for air pollution from vehicles. Also, the most popular private vehicles (minivans, sport-utility vehicles, and pickups) currently have less stringent emission standards than those for cars. Although federally required emission controls on automobiles have been becoming more stringent, at some point the increasing number of vehicle miles traveled may offset the reduced air pollution from each individual vehicle. Requirements for emission controls on heavy-duty engines in trucks, construction equipment, tractors, locomotive engines, and airplanes are just now being established.

- Greenhouse gases? The local trend in carbon dioxide and other "greenhouse gas" emissions from fuel combustion, transportation and agricultural production is unknown because these emissions have not been inventoried.
- Lincoln–Lancaster County enjoys a high rate of compliance with air pollution rules. All new air pollution sources of a certain size apply for and quickly receive authorization to construct processes that have appropriately minimized air pollution. Stationary air pollution sources of any significant size have or will soon have an air quality operating permit that lays out all the rules applying to their business or operation. Most receive an annual inspection. Typically 96% of these pollution sources are in compliance. Out of approximately 150 asbestos demolition/renovation projects conducted annually to which the federal asbestos regulations apply, the compliance rate is typically 97%. Businesses or operations that manufacture, store, or use a certain amount of chemicals that have the potential to cause catastrophic offsite health effects if those chemicals were accidentally released are required to develop Risk Management Plans to minimize the possibility that accidents might happen and to mitigate the effects of a release. In Lincoln–Lancaster County, many of these are small businesses that store ammonia or propane. The compliance rate with this rule is 91%.
- Community air pollution concerns are health-related. Some Lincoln–Lancaster County residents (including regulated businesses, neighborhood associations, government, and the general public) were surveyed on their concerns, expectations, and hopes for clean air in 2010. They were mainly concerned about the adverse health effects that air pollution can cause. The top-ranking goals were to reduce air pollution from all sources, to maintain the NAAQS, and to reduce health risk posed by air toxics.

Health Disparities

Determining whether racial and ethnic minorities are disproportionately affected by air pollution is a matter of identifying either exposure levels to air pollutants present in minority neighborhoods or, at least, the presence of air pollution sources in those neighborhoods. Monitoring for criteria pollutants is conducted at sites that represent the highest expected concentrations. Years of monitoring continue to show low levels of pollution even at these potential "hot-spot" locations. Results from PM2.5 monitoring, which is conducted at a site expected to be typical of citywide exposure levels, are not yet available for analysis.

An EPA computer modeling study was

completed in 1998, which predicted concentrations of HAP within each census tract from stationary, mobile, and area source HAP emissions. By mapping these concentrations using the Geographic Information System (GIS), total HAP concentrations were shown to vary among the census tracts. Minority census tracts were in the low to medium range for total HAP concentrations. The census tracts with the highest total HAPs were not those minority neighborhoods, but were more highly correlated with transportation corridors. The conclusion drawn from this information is that minority communities in Lincoln do not appear to be disproportionately affected by air pollution.

Public Health Infrastructure

In general, the infrastructure for assuring clean air within Lincoln–Lancaster County is well developed. LLCHD implements the federal regulatory program as well as promotes pollution prevention through non-regulatory approaches. Funding for air quality activities is generally adequate. Approximately 20% of the program is funded through federal money passed through from the state Department of Environmental Quality. Fees paid by regulated air pollution sources fund the remainder. A source pays based on the amount of air pollution it emits annually. LLCHD believes that this fee structure is another way of encouraging emission reductions. However, we have already experienced revenue loss as a result of emission reductions. The department had to compensate by establishing fees for all regulated sources, rather than just a few. As the program continues to be successful in reducing emissions, the fee structure may have to be revised.

In addition to funding, another infrastructure issue relates to authority to require risk reduction. In some states and localities, regulations exist that require a source of an unacceptable health risk posed by emissions of air toxics to reduce those emissions. LLCHD has a requirement that if a new stationary source of air pollution will emit a threshold amount of any of the air toxics, that source must use the best available control technology to minimize emissions. However, this does not apply to existing sources nor to mobile sources. If a desired clean air goal is to reduce risk from air toxics, a mechanism to do so will have to be identified. This mechanism may be an enhanced voluntary program that encourages risk reductions, a clarification of whether the general public health protection authority of the Health Director applies to the situations, or the establishment of new regulations.

Recommendations

- The overarching recommendation is to protect the relatively good air quality that Lincoln–Lancaster County enjoys and prevent future air–quality problems.
- Continue to implement the federal Clean Air Act as a way of assuring that the NAAQS will not be exceeded and that air toxics emissions will be minimized.
- Assess how much air pollution is emitted by cars, trucks, construction equipment, planes, and rail locomotives (i.e., mobile sources).
- Participate in the Metropolitan Planning Organization to monitor and

influence how Lincoln and its transportation system grow; advocate for transportation and land-use decisions that avoid adverse impacts on air quality.

- Assess air toxics risk by conducting a comprehensive inventory of emissions from stationary, mobile and area sources (i.e., small, broadly distributed air pollution sources such as vehicle fueling, painting, and auto-body repair facilities) followed by exposure modeling. Air toxics monitoring is another method of identifying exposure levels. Assess the health risk and identify the sources that contribute most to that risk. Use health benchmarks as a way of evaluating if unacceptable risk from air toxics exposure exists. If so, establish and implement a risk-reduction plan.

Notes

Related discussion or indicators are located in the chapters on *Toxic and Hazardous Materials* and *Public Health Emergency Management*.

Table 1

-- Currrently no data source.

1. U.S. Environmental Protection Agency, *EPA Strategic Plan*, September 1997.
2. Lincoln–Lancaster County Health Department, Air Monitoring Data, December 1999.
3. Nebraska Department of Environmental Quality, *Nebraska Air Quality Reports*, 1998.
4. *National Air Quality and Emissions Trends Report*, 1997.
5. Lincoln–Lancaster County Health Department, Air Program, 1998 data from Emissions Inventory (stationary sources only).
6. Nebraska Department of Environmental Quality, 1998 data from the Emission Inventory.
7. *National Air Quality and Emissions Trends Report*, 1997 data from only stationary sources.
8. *National Air Quality and Emissions Trends Report*, 1993 data from only stationary sources.
9. Based on 1993 levels.
10. Currently no data source. Could be obtained through air quality measures, modeling, risk assessment, and setting of community–accepted risk levels. See Public Health Infrastructure section for discussion of measurement methods based on national risk assessment methodology.

Clean Indoor Air

Health Objectives for the Year 2010: Prohibit smoking in most public buildings, unless it is within an enclosed, separately ventilated area. Manage public buildings, such as schools, office buildings, and government offices, for good indoor air quality. Assure that new buildings meet American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) standards for ventilation.

Health Implications

Poor indoor air quality is an important environmental health concern because the average person spends more than 90% of his or her time indoors. Indoor air quality studies have found recurring correlations between indoor air pollution and human illness. Common symptoms associated with contaminated indoor air include headaches, eye irritation, respiratory irritation, and gastrointestinal distress. Some indoor air pollutants have been linked directly to fatalities, such as carbon monoxide or *Stachybotrus* toxin. Indoor air pollution can trigger asthma attacks. Causes of indoor air pollution include lack of ventilation, improper venting of combustion exhaust, environmental tobacco smoke, off-gassing of building materials, production of paper or copier particulates, growth of mold and mildew, and improper use of hazardous materials. Poor indoor air quality has a huge impact in terms of productivity and lost work time.

Currently, there are no federal or local regulations that require indoor air quality to be protective of human health in public buildings. The Nebraska Clean Indoor Air Act (NCIAA) requires designation of smoking and nonsmoking areas of public buildings, but it does not broadly protect indoor air quality. Consequently, education and technical assistance are the primary tools used by LLCHD to reduce risks from indoor air pollution. The program is based on hazard identification and providing technical assistance to home, building, and business owners on how to reduce the health risk from exposure to indoor air pollution. This may be accomplished through over-the-phone consultation, distribution of educational materials, or on-site investigation. A typical on-site investigation includes evaluation of possible sources of pollution, a survey of occupants to identify patterns of illness, and environmental monitoring. There are no health-based, chemical-specific standards for indoor air quality. However, ambient screening for temperature, humidity, formaldehyde, volatile organic compounds, carbon dioxide, carbon

Table 1. Clean Indoor Air Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2005
Percent of public buildings that are smoke free	--[1]	100.0	--	--	--	--
Percent of schools and child care centers that are implementing an indoor air quality management plan	1.7[2]	15.0	--	--	--	15.0[3]
Percent of office buildings that are implementing an indoor air quality management plan	--[4]	10.0	--	--	--	5.0[3]
Percent of government offices that are implementing an indoor air quality management plan	12.5[5]	25.0	--	--	--	--
Percent of new buildings that meet American Society of Heating, Refrigeration, and Air-Conditioning Engineers standards for ventilation	--[4]	100.0	--	--	--	--

monoxide, and hydrogen sulfide and testing of air handling units for air velocity and flow rates can provide information on the healthfulness of the indoor air. These environmental tests, along with visual identification of indoor air pollution sources, form the basis of risk-reduction recommendations provided to home, building and business owners.

Current Status and Trends

Between 100 and 200 on-site case investigations of indoor air pollution are conducted annually in Lincoln–Lancaster County. A review of these investigations reveal that some conditions and situations are common to indoor air quality problems.

Improperly designed, operated, or maintained heating, ventilating, and air conditioning systems are the source of about 50% of indoor air quality problems. Specific problems include poorly maintained equipment contaminated with standing water or dirt, deteriorating mechanical parts, poor air filtration, lack of fresh air, deteriorated fiberglass-lined ductwork, insect and animal infestation, poor design, and improper location of fresh air intakes near outdoor air contamination sources.

Remodeling activities cause about 30% of indoor air quality problems. Problems include use of products containing volatile organic chemicals without regard to label restrictions; lack of adequate ventilation; escape of dust and chemical vapors from remodeling area into adjacent occupied areas of buildings, resulting in exposure to the public and building occupants; and ongoing emissions of chemical vapors from installed materials after completion of remodeling projects.

Miscellaneous problems cause about 20% of indoor air quality problems. These include smoking in public places, multi-family dwellings, and dormitories; exposures resulting from home hobbies; contamination of the general air in multi-use office buildings by a single tenant's activities; and microbiological contamination due to flooding, water leaks, condensation, groundwater, and other water sources. Recently, a large number of investigations have been made for mercury vapor caused by broken thermometers and other metallic mercury sources.

Pollutants of Special Concern

Environmental tobacco smoke (ETS) is an irritant, an asthma trigger, and increases the risk of lung cancer in nonsmokers. Although the Nebraska Clean Indoor Air Act promotes the use of designated smoking areas, it does not effectively protect the public from ETS exposure in restaurants and public buildings.

Carbon monoxide (CO) is a potentially lethal indoor air pollutant. Exposure can also cause significant nonlethal illness. With the increasing use of CO detectors, calls regarding this pollutant increased, especially from people who assume their new detector is malfunctioning when it begins sounding soon after it is installed. Resolution of the problem typically involves Peoples Natural Gas, whose staff can examine furnaces, water heaters, and stoves to determine if any defects are causing a buildup of CO. The Indoor Air Quality Program's role is in educating the public on how CO is formed and how its buildup can be prevented. Second, the program provides technical assistance to the Lincoln Fire Department on policies related to handling CO detector alarm calls.

Ozone from ozone-generating "air purifiers" or "air cleaners" has become a pollutant of concern in recent years. Ironically, businesses or homeowners purchase these devices out of concern

for improving indoor air quality. In reality, ozone is a potential eye and respiratory system irritant that has some effectiveness in destroying odor-causing organics but only at concentrations so high they cannot be tolerated by humans. Although some machines have the capability of limiting ozone output, LLCHD continues to follow EPA's lead and advocate for the traditional IAQ improvement strategies of source reduction, filtration, and proper ventilation.

Mercury vapor from broken thermometers, thermostats, fluorescent light bulbs, and blood pressure cuffs and other sources of metallic mercury is a hazard of which the public has become more aware in the last two years. As a result, a large number of calls have resulted in investigations and assisted cleanups. Mercury poisoning can cause emotional disturbances, fatigue, kidney damage, and other serious health problems. As with other pollutants, children are particularly susceptible to exposure and to central nervous system effects caused by poisoning. LLCHD provides assistance in assessing spills and cleaning up contaminated surfaces in order to reduce health risk from the vapor. LLCHD actively promotes the use of nonmercury thermometers and other devices.

Radon is categorized by the EPA as one of approximately 20 known human carcinogens. It is also considered a distant second to cigarette smoking as a leading preventable cause of lung cancer. The risk of lung cancer increases with exposure to increasing levels of radon in the indoor environment. A combination of cigarette smoking and long-term exposure to increased levels of radon increases individual risk exponentially. The LLCHD provides long-term (one-year) test devices to the general public, businesses, schools, and government agencies at cost. The test devices include analysis by a certified laboratory and a report issued by LLCHD with interpretation of the results and recommendations for hazard mitigation. During the last year, 19 test devices were sold and 12 reports issued. Sixteen of the 19 tests revealed results above the EPA action level of 4 pic/L. Mitigation recommendations were provided to the home and building owners to assist them in reducing the risk to building occupants. LLCHD staff members are in the process of following up with the home and building owners to determine if mitigation occurred. Constructing buildings to be radon resistant is a known technology which is not in wide spread use in Lincoln–Lancaster County.

Indoor air is an important aspect of keeping children's environments healthy. As national focus turns to reducing the incidence of asthma in children, identifying and eliminating asthma triggers in the indoor environment and reducing other indoor air pollution sources is becoming important. Over the past two years, LLCHD promoted the adoption of EPA's "Tools for Schools" in Lincoln–Lancaster County schools and childcare centers. This tool allows a school to assess current indoor air quality problems and establish a plan to manage the school building for good indoor air quality to prevent future problems. Currently, only two schools have completed the process nevertheless, LLCHD continues to promote the use of "Tools for Schools."

LLCHD has also been promoting the development of indoor air quality management plans for public buildings. This is being piloted with several City–County government buildings managed by the Building Commission using EPA's "Building Air Quality Management" guide.

Health Disparities

Indoor air quality problems have been observed in the spectrum of building from old deteriorated homes to new expensive homes. However, solving these problems is related to having the property control and resources to effect repairs or improvements. As a result, children in poverty, low-income persons, and minority populations may be disproportionately affected by indoor air quality problems because there is a higher proportion of renters among these groups.

Public Health Infrastructure

- As mentioned, no effective regulatory structure exists to assure that Lincoln–Lancaster County residents have clean indoor air. The Nebraska Clean Indoor Air Act needs to be made more enforceable and perhaps broadened to address issues other than just ETS. Another mechanism that would provide some assurance would be a local ordinance limiting ETS and other indoor air quality issues.

Several objectives relate to increasing the number of buildings that are smoke-free, have IAQ management plans or are designed to meet ASHRAE ventilation standards. However, the baseline number of buildings that meet these objectives is unknown. An important infrastructure need is to identify the baseline against which progress can be measured.

Recommendations

- Continue to promote practices that result in clean indoor air: indoor pollution source elimination, appropriate ventilation, and good operation and maintenance of ventilation systems. This promotion occurs through education and on-site technical assistance to individual homeowners and building managers; educational outreach to builders, HVAC contractors and architects on indoor air quality issues and educational outreach and technical assistance to schools, daycare centers, and building managers on developing and implementing indoor air quality management plans.
- Advocate for prohibition of smoking indoors through strengthening the NCIAA or passing a local ordinance.

Notes

Related discussion or indicators are located in the chapters on *Toxic and Hazardous Materials* and *Tobacco Use*.

-- Currently no data source.

1. Currently no data source. Measurement approach should be developed which surveys and includes the range of public and business spaces open to the public.
2. Lincoln–Lancaster County Health Department, Indoor Air Program, Tools for Schools assessments.
3. United States Environmental Protection Agency, *EPA Strategic Plan*, September 1997.
4. Currently no data source. Strategies to measure these indicators are in development by the Lincoln–Lancaster County Health Department, Indoor Air Program.
5. Lincoln–Lancaster County Health Department, Indoor Air Program.

Toxic and Hazardous Materials

Health Objectives for the Year 2010: Reduce the public health risk posed by hazardous and toxic chemicals.

Health Implications

Adverse health risks for workers and for the public exposed to toxic materials released to the outdoor and indoor environment's are increasing. During the last half of the twentieth century, society became dependent on products that are synthesized from chemical materials. Plastics, synthetic fabrics, rubber products, coatings and finishing products, and cleaning solvents are but a few examples.

The health risks created by hazardous materials are present in our environment. Exposure to hazardous chemicals from cleaning chemicals, cosmetics, hobby materials, painting and redecorating supplies, and pesticide use in the home is believed to play a significant role in the increased incidence of asthma as well as other respiratory illnesses. Center for Disease Control (CDC) estimates that 15 million Americans, including almost 5 million children, suffer from asthma. The estimated number of asthma sufferers increased from 6.7 million to 13.8 million in from 1980 to 1994. Premature deaths are numbering 50,000 to 120,000 associated with exposure to toxic air pollutants and include 4,000 deaths from asthma.

In the work environment, people can be exposed to any number of hazardous materials. In addition, some materials become airborne, where they become a threat to those who do not work directly with the materials. Some of the more common adverse health effects that can be attributed to exposure to toxic materials in the workplace are allergic reactions and contact dermatitis, which according to the CDC, make up 15% to 20% of all occupational diseases. More serious illnesses that may occur from exposure to toxics in the work place are central nervous system disorders; failure of vital organs, such as the heart and liver; lung damage; and cancer. Examples of hazardous workplaces include the horticultural services industry, where 17% of worker injury and illness is due to chemical exposure. Small trades businesses have a similar 17% rate of worker injury, and illness is due to chemical exposure. There is minimal data for many small businesses, including dry cleaners, beauty shops, furniture strippers, and auto repair shops. However, because of the use of solvents and other toxic products, workers in these industries can be at risk for both acute and chronic illnesses. In addition to routine workplace exposure, accidents involving hazardous chemicals may result in serious burns and acute poisonings.

Table 1. Toxic and Hazardous Materials Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Poisonings by household chemicals among children under six per 1,000 population	7.2[1]	5.4	--	--	--	**Re.** by 25%[2]
Quantity of toxic pollutants released, disposed of, treated, or combusted for energy recovery through pollution prevention practices	--[3]	**Re.** by 25%	--	--	--	**Re.** by 25%[4]
Percent of businesses that use hazardous chemicals	--[5]	25.0	--	--	--	--
Percent of adults who buy less toxic products	60.0[6]	75.0	--	--	--	--
Percent of adults who properly dispose of used car oil after changing it	37.0–49.0[7]	75.0	--	--	--	--
Proportion of waste loads containing hazardous waste based on random load checks	10.0[8]	7.5	--	--	--	--
Stormwater meets National Pollution Discharge Elimination System (NPDES) requirements	**Att.**[9]	**Maint.**	--	--	--	--

Re.=Reduce levels **Att.**=Attained **Maint.**=Maintain attainment

Family members of workers who transfer hazardous and toxic materials from the workplace to the home environment are also at risk of adverse health effects. Among the hazardous chemicals that have caused family illness are heavy metals, such as lead, beryllium, and mercury; pesticides, such as parathion and toxaphene; and other chlorinated hydrocarbons.

Health risks also result from contaminated water caused by release of toxic waste materials and fugitive air emissions. Because water is essential for life, contamination of water resources with hazardous and toxic materials is considered a vital health issue. Of primary concern are adverse health effects caused by contamination of drinking water for which the health risks are well documented. Small amounts of various chemicals, principally heavy metals and volatile organic compounds, are known to affect human health in various ways. There are relatively few incidents involving acute chemical poisonings from drinking water; the health effects are generally caused by ingestion of the contaminated water over a long period of time. Central nervous system disorders, damage to internal organs, and cancer may result from long-term ingestion of chemical contaminants. Improper and indiscriminate disposal of toxic chemical wastes plays a significant role in the contamination of both surface water and groundwater, both of which eventually become part of the public drinking water supply.

In rural Lancaster County, all drinking water comes from groundwater. With the exception of incorporated towns and villages, domestic sewage disposal is accomplished through use of in-ground septic systems. In areas with a proliferation of small acreages, groundwater contamination from household chemicals disposed of in septic tanks may become a public health issue.

Improper and indiscriminate disposal of toxic chemical waste may also play a significant part in creating health risks in recreational waters. Pesticides washed into natural waters used for swimming may be responsible for an increase in the number of cases of central nervous disorders, damage to internal organs, and cancer. In addition, exposure to other toxic chemicals in water may cause an increase in contact dermatitis among swimmers. Small creeks and streams are favorite places for children to explore. Chemical wastes indiscriminately dumped in small streams can cause acute poisoning from contact with the chemicals.

Some people in the community rely on fish as a primary source of food. Those same people often fish area lakes, rivers, and creeks to obtain fish to eat. This is particularly true with minority populations, principally Asian Americans. Excessive and improper use of pesticides, together with illegal disposal of toxic chemical wastes, may cause the fish and other edible aquatic life to become carriers of toxic materials, which poison those who eat them. As with contamination of groundwater, the public health implications are generally long-term effects from continual consumption of these fish and other edible aquatic life as a food source.

The number of chemically related accidents in the home, especially among children is rising.
Nationally, misuse of household chemicals results in thousands of accidents each year. These accidents typically occur when a product is used for a purpose for which it was not intended or when two chemicals are mixed together, resulting in a violent chemical reaction and release of toxic gases. The most common exposure is to chlorine, which causes severe upper respiratory distress. Such a reaction may be fatal in instances where the exposure is to small children, those with existing respiratory illness, and the elderly.

The U.S. Environmental Protection Agency (EPA) states that according to a

recent survey, 75% of households in the nation use at least one pesticide per year. When ingested or misused, household pesticides can cause acute poisoning from ingestion and cause damage to the nervous system, which may be permanent. There is also a health threat to family members when a worker brings home toxic products from the workplace for household use.

Current Status and Trends

In 1962 the book, *Silent Spring* by Rachel Carson, offered the first frightening look at widespread environmental degradation through pollution of the land, water and air. *Silent Spring* planted the seeds of environmental awareness that continue to grow. Initial efforts to address environmental concerns focused on controlling pollution. Over a thirty-year period, billions of dollars were spent attempting to reduce the amount of pollution by controlling emissions from industry and transportation. While these efforts have led to successful reductions of pollution in a single environmental medium (i.e., air, water, land), in many cases, the pollution was only transferred from one medium to another, (e.g., land to air) and the threat to public health was not effectively addressed.

In the 1990s, the focus turned to reducing pollution by eliminating the chemicals and processes that create the pollution. The principles of "pollution prevention" center around the idea of not creating the products that cause pollution and are accomplished by using fewer toxic products, reducing quantities of polluting wastes, reusing waste products, and recycling wastes. Reduction is accomplished by selecting raw materials that cause less pollution and developing processes that create less polluting waste. By eliminating toxic materials, pollution prevention takes away the threats to public health created by them.

Pollution prevention is not exclusive to industry. Pollution prevention should involve all sectors of society from the largest industry to the small "mom and pop" business to the individual homeowner. To gain a better understanding for establishing community pollution prevention goals, we need to examine pollution prevention as it relates to three segments of the community: large industry, small businesses, and households.

Large Industry

In Lincoln and Lancaster County, there are thirty-four businesses which are of sufficient size to require submission of a Toxic Release Inventory (TRI) to the EPA. The TRI provides an indication of those large industries that contribute toxic materials to the environment.

Large industries tend to be more closely regulated than small businesses by the EPA and the Occupational Health and Safety Administration (OSHA). As a result, large industries have been forced to be more proactive in addressing health, safety, and environmental issues. In addition, many labor and union groups become proactive in environmental issues in the workplace as well as the community.

Large industries have found that the cost to control and dispose of toxic wastes has become a very significant burden in their attempt to minimize costs. The demand for raw materials that result in fewer toxic wastes has spurred raw-materials producers to develop less toxic products. To remain competitive, large industries must keep up with changing technology, including machines and processes that reduce the regulatory impact through pollution prevention. In addition, programs with a pollution prevention component are

often pursued by companies to increase public trust and reduce worker compensation costs.

Finally, larger industries tend to have more resources to devote to environmental issues, often including at least one staff person. They also have the resources necessary to implement changes in products and processes that reduce the waste generated by the facility. When new technology is developed, the larger businesses are more able to justify the cost of change. In fact, a process change often results in cost savings due to the decrease in costs of hazardous waste disposal.

The City of Lincoln and Lancaster County have chosen to regulate certain business wastes that pose a health risk to the public and to employees working at disposal facilities for better safety and to assure compliance with state and federal waste-management regulations. The program requires Special Waste Disposal Permits for those wastes that present health risks. A significant effort has been made over the life of the program to encourage the business community to use the principles of pollution prevention to reduce the amount of special waste being disposed of in the community.

Small Businesses

Small businesses have considerably fewer incentives and resources to adopt pollution prevention practices. There are many factors that influence the decisions of the small business owner regarding pollution prevention.

Many small business owners do not possess a clear understanding of potential health risks from exposure to hazardous and toxic materials. The complexity of environmental rules and regulations makes them difficult to understand and apply. Because time is so important, small business operators may not take adequate time to become familiar with the health risks posed by the products they use, to prevent releases and clean up spills, to take advantage of training opportunities, or to implement process changes or product substitutions.

For the small business owner, there is less regulatory pressure because state and federal regulations typically exempt small businesses. As a result, small business owners often spend fewer resources on pollution prevention, opting to use them to expand the business. Because of close profit margins, a small business owner is less likely to purchase alternative products to implement a pollution-prevention strategy. Small business owners are often not familiar with nonregulatory options concerning waste management. They may not be aware of cost-effective ways to reduce the use of hazardous or toxic materials, to reuse the materials, or to safely recycle these materials.

Small businesses may not have access to training or may not be aware of training opportunities. With limited time, money, and staff, a small business owner may conclude that it is not economically feasible to focus on pollution-prevention practices. The costs to train, change processes, and implement new methods can significantly affect their decisions.

Many small business owners are fiercely independent and have been successful in business for a long time. They know what works for them, and they often resist suggestions to change their way of doing business. When a business has operated successfully for many years, the resistance to change can be very great. In many cases, government is viewed as an impediment to effectively and efficiently conducting business. Although independent, many small business owners reach out to others for advice in running their businesses. Small business associations, trade associations, and nonregulatory business assistance agencies, such as the Small Business Administration SCORE program, could provide support

in encouraging small businesses to practice pollution prevention.

As industry and small businesses recognize and experience the benefits of pollution prevention, the trend will be for them to continue adopting the principles of pollution prevention. Community efforts should continue to encourage both large and small companies to actively practice pollution prevention. Education and technical assistance are the keys to success in this endeavor.

Households

In 1990, the American Association of Poison Control Centers reported that 79,000 children were involved in common household pesticide poisonings or exposures. According to data from emergency rooms in Lincoln, 30 to 35 children are seen for household chemical poisoning each year.

From September 1990 to September 1999, LLCHD emergency response staff responded to 20 calls related to accidental releases or improper handling of toxic chemicals in homes. Two of these incidents involved acute adverse health effects on residents living in the homes.

Based on information from the Community Pollution Prevention Assessment conducted in 1995, skills in selecting products that are less toxic or less hazardous were rated low by householders. Product effectiveness was the key factor in purchasing, and 81% of those surveyed indicated they would be willing to pay more for less toxic materials. This suggests that with more education about the toxicity of products, homeowners would buy less-toxic but more expensive products if the product was equally as effective.

From 1992 to 1998, over 144 tons of household hazardous waste were collected from Lincoln and Lancaster County residents. In 1998, 33 tons were collected. These wastes included pesticides, solvents, items containing PCBs, and heavy metals. Citizens with waste locally recyclable, such as motor oil, antifreeze, batteries, and fluorescent bulbs, were referred directly to local recyclers.

Citizens unsure how to get rid of a waste will often store it, increasing health risks in the home. In a 1993 survey taken at household hazardous waste collections, 45% of participants reported that they would have continued to store the hazardous waste at home if the collection was not available. Twenty-three percent of collection participants would have put the hazardous waste into a trash can. In a 1995 minority survey, 39.8% of respondents said they or someone in their home changes their own car oil. Of those changing their own oil, 11.5% keep or store it and 33.5% dispose of it improperly (put it in the garbage or pour it down the drain, in the street, or in the backyard.

Health Disparities

"Environmental Health Hazard Risks In The Minority Community," a study conducted by the LLCHD in 1997, revealed the following influences on the risk of exposure to toxic and hazardous materials in the minority populations in Lincoln:

- The tendency to use hazardous materials for purposes other than their intended use. An example is using gasoline as a cleaner.
- The tendency to accumulate hazardous materials as a form of wealth.
- Consumption of fish from water sources that may contain toxic pollutants.
- Distrust of the safety of public drinking water.

- Lack of familiarity with public facilities for hazardous waste disposal.

The reasons for these disparities involve barriers caused by cultural differences, language, social upbringing, and lack of education. Further development of educational programs to reduce risks among the minority populations is needed. No single community program will work for all minority communities. To overcome these barriers, the overall community needs to develop and support programs within the minority communities that fit the culture and language of that community.

Public Health Infrastructure

An ongoing mechanism for evaluating the impact and success of community interventions to reduce the public health risk posed by hazardous and toxic materials is needed. The development and periodic implementation of an environmental health behavior and risk survey is recommended.

Recommendations

Reduce the public health risk posed by hazardous and toxic chemicals the following actions are recommended:

- Community efforts should continue to encourage large businesses to actively practice pollution prevention. Education and technical assistance are the keys to success in this endeavor.
- Pollution-prevention efforts for small businesses need to be directed toward the development of educational partnerships that target trade associations and small business as a means of reaching the small-business owners. Programs with incentives should be offered to small businesses to overcome the factors that inhibit small businesses from practicing pollution prevention.
- Pollution prevention efforts need to be facilitated through organizations in order to be successful in the small-business community. Community colleges and technical schools should be partners in promoting pollution prevention in small businesses.
- More effort and resources should be directed toward addressing pollution prevention in the home, with a focus on reducing the health risks associated with use of toxic products.
- The community needs to continue to regulate the disposal of hazardous and toxic waste in the city and county to assure that the health risk to public and city workers is minumized.
- The overall community needs to develop and support programs within the minority communities that fit the culture and language of that community.

Notes

Related discussion or indicators are located in the chapters on *Water Management*, *Clean Outdoor Air*, *Clean Indoor Air*, *Public Health Emergency Management*, and *Waste Management*.

Table 1

-- Currently no data source.

1. Lincoln–Lancaster County Health Department. Estimated number of poisonings of children under 6 due to household chemicals, 1992–1995. Tabulation derived using E-codes 850–869 with available Injury Surveillance Data (Emergency Room Visits) 1992-1995, mortality data 1987–1998, and inpatient hospitalization discharge data. The local objective represents a 25% reduction, which is the overall national objective as well.
2. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. The national objective is to reduce by 25% the number of poisonings from those tabulated in 1995 by the Toxic Exposure Surveillance System, American Association of Poison Control Centers. While national tabulations of poisonings are not comparable to the local rate, the goal of a 25% reduction is the same.
3. Currently no data source. A measurement strategy for this grouping of pollutants needs to be developed. The local objective parallels the national objective of a 25% reduction.
4. U.S. Environmental Protection Agency, *EPA Strategic Plan*, 1997, pp. 37. The national objective is to reduce this type of pollution by 25% from the 1992 level by the year 2005. No data, pollutants or measurement methods are specified in the EPA Strategic Plan document.
5. Currently no data source. A measurement strategy needs to be developed that utilizes data from Tier II, TRI, RMP and Special Waste categories of hazardous substances used by businesses.
6. Lincoln–Lancaster County County Health Department, *Community Pollution Prevention Assessment: Household Report*, 1995. Household survey data indicating the percentage of adults reporting that they purchase less toxic products "often" or "very often".
7. Lincoln–Lancaster County County Health Department, *Community Pollution Prevention Assessment: Household Report*, 1995 (49%) and *Environmental Health Hazard Risks in the Minority Community*, 1997. (37%). Household survey data indicating the percentage of adults reporting that they properly dispose of used car oil after changing it.
8. City of Lincoln, Department of Public Works. 1998 data provided by staff from the results of random load checks at both Lancaster County landfills.
9. Lincoln–Lancaster County County Health Department, Environmental Health Division. The standard is maintained – toxicity levels are below NPDES required levels. The objective is therefore to maintain these toxicity levels below NPDES limits.

Public Health Emergency Management

Health Objectives for the Year 2010: Reduce the adverse public health impact caused by chemical accidents and natural disasters.

Health Implications

Whether a disaster in the community is caused by a natural event (tornado, flood, earthquake, or snowstorm), accidently by people (chemical spill, large fire, or chemical air release), or purposely by people (a terroristic chemical or biological event) the results are very similar. The resources of the entire community can be taxed beyond their limits. Basic needs, such as shelter, food, and water, may be taken away. The public health implications are numerous and complex. Those things citizens take for granted that provide a healthy community may suddenly become unavailable.

Natural Disasters

Natural disasters usually involve the destruction of property and the displacement of people. Power is often lost, and communications may be severely hampered. Transportation is disrupted. Water supplies may become contaminated. Sewage systems may fail. Food, which is normally protected, becomes an attractant to insects and vermin. Many citizens maybe injured, and there may be loss of life. When these events occur, the community becomes more vulnerable to the spread of disease. Destruction of property also opens up the possibility that hazardous materials may be released into the environment. When chemical containment and safety systems fail, these materials may cause both acute and long-term adverse health effects to those who are exposed to the material.

Providing shelter for citizens who are displaced from their homes creates unique health problems. Because shelter needs may extend over several days and even weeks, sanitation in the shelter must be monitored closely to control the spread of illness and parasites. The medical services in the community can be taxed beyond limits. Many injured may need care. The stress of such events typically cause more heart attacks and mental disorders than normal, which place an additional burden on the health system. The elderly and those with severe chronic health problems are particularly vulnerable and will require special attention to assure the maintenance of their health status.

A public health issue in emergency response that is often overlooked is that of animal control. Pets and livestock become separated from their owners and are forced to fend for themselves in the environment. Many animals may become afraid and defensive, creating

Table 1. Public Health Emergency Management Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Increase the capacity of the community to reduce or avoid public health consequences caused by chemical and biological releases and natural disasters (developmental)	--	--	--	--	26 objectives established[1]	reach all 26 objectives[1]
Plans are approved by elected officials and in place that assure that the health of the community is protected	LEOP plan[2]	annual exercise & review	53.8[3]	--	--	--
Establish and implement standards that meet or exceed national standards such as NFPA and assure protection of public health in key areas of training, medical monitoring, incident command, emergency operations, mass casualties, sanitation, shelter and essential services	0[4]	standards implemented in all areas	--	--	--	--
Percentage of key health professionals identified in the training standards who are adequately trained to handle disasters in the community	--[5]	100.0	--	--	--	--
Percentage of identified health delivery service resources available to handle disasters in the community	--[5]	100.0	--	--	--	--
Percent of population living in moderate to high risk areas for hazardous chemical releases as defined by probability and consequences analysis	80.0[6]	20.0	41.0[7]	--	--	--
Percent of population with knowledge of how to respond to emergency situations	--[5]	75.0	--	--	--	--
Percent of population in vulnerable zones who know how to respond in the event of emergency chemical release	--[5]	90.0	--	--	--	--
Percent of population trained in CPR	--[8]	50.0	--	--	--	--
Percent of population trained in basic first aid	--[8]	50.0	--	--	--	--

an increase in numbers of animal bites. The potential for development of a rabid animal population increases.

All of these natural disaster results may persist over a long period of time until the community can recover. Complete recovery could take several months up to years.

Chemical Releases

Accidental releases of chemicals into the environment have varying effects on a community, depending on the material released and the media it is released into (air, water, or soil). Releases into the water and soil have much less immediate public health impact than release into the air. Air releases of toxic chemicals nearly always require an emergency response to assure protection of the public. Depending on the type and quantity of material released, the public health impact can include dermatitis, respiratory distress, neurological damage, and damage to vital organs. The effects range from mild irritation to coma and death. In some instances exposure to a toxic chemical can lead to a debilitating illness or cancer many years later.

Although an airborne toxic release creates an immediate or acute problem, once the release is contained, the immediate effects become short-lived. However, during the time the event is occurring, the health risks are far higher, with the probability that injury and death will be greater, and in some instances significantly greater. These events can last from hours to several days. Except when a chemical contaminates the environment or when a significant proportion of the population is harmed, the demand for disaster resources tends to be less than in a natural disaster. Disruption of utilities may also be considerably less and sheltering may be needed for a much shorter duration.

Finally, cleanup of a release site has a significant impact on public health. With most toxic chemicals, it is necessary to remove all contaminants and perform environmental testing to assure that no threat to public health remains. In addition, depending on the chemical exposure, those people exposed may require medical monitoring over an extended period of time.

Terrorism

Acts of terrorism may take place in the form of an exploding bomb, the intentional release of a highly toxic chemical, or the release of a deadly pathogenic organism. The effects of an exploding bomb are similar to the effects of a natural disaster, only more limited in scope. Property damage, injury, and death are the prime objectives of the terrorist – to cause political change. In addition, the terrorist usually has a specific target in mind.

Terrorists who use chemical and biological agents as terroristic weapons want to make a statement by killing and injuring people and causing terror. Damage to property is not of concern and in fact may be something the terrorist wants to avoid. In either case, with one exception, biological and chemical attacks are similar to accidental air releases of highly toxic materials. The exception is that chemical attacks generally have an immediate impact that overpowers the emergency-response capability, where as a biological-agent attack has a delayed effect. Typically, there may not be an emergency response to a biological-agent attack unless the perpetrator announces the attack at or before the time the attack occurs. The public health response to a chemical attack is the same as for a toxic air release, while the response to a biological attack is much more extensive and will involves all facets of the public health delivery system.

In any event, the health effects of a chemical or biological terrorist attack range from severe dermatitis, severe respiratory distress, and severe neurological damage to damage of vital organs and death. Where biological agents are used, disease may be spread by person-to-person contact through airborne aerosols or water. The potential exists for many people to be injured, made ill, and killed.

Current Status and Trends

Natural Disasters

Determining the risk presented by a natural disaster is difficult at best. By far the most serious natural disaster threat in Lancaster County is from tornadoes, which occur frequently in the Midwest. Most occur during the months of May through early July. Data from the Lincoln–Lancaster County Emergency Management Office show that from 1950 to 1998 there have been thirty tornados in Lancaster County.

Flooding occurs on a regular basis in Lincoln and Lancaster County. Because of the extensive flood-control work done over the years, the chances of a disastrous flood have been reduced. Despite those efforts, flooding is considered to be the most likely naturally occurring disaster in the community. One hundred-year and 500 year flood data indicate the worst flooding scenarios. Table 2 shows the numbers of residences, businesses, and industries that would be adversely effected by 100-and 500-year flood.

Table 2: Number of residences, businesses and industries affected by flooding in Lincoln.

	100-year flood	500-year flood
Residences		
Single Family	2,122	2,788
Duplexes	149	209
Multiple Family	99	109
Businesses	306	366
Industries	340	418

In 1996 an ice and snow storm caused significant concern in the community. Power and communications were disrupted for up to five days. A serious public health concern was hypothermia, especially for the elderly. In addition, some immigrant families were forced to find alternate sources of heat. There was a serious concern they would use charcoal grills, propane heaters, and other heat sources not properly vented to the outside air and then be exposed to carbon monoxide.

Chemical Releases

From September 1, 1998, to the same date in 1999, LLCHD staff responded to 178 hazardous material spills, releases, and abandonments. This represents a 65% increase over the previous year. Figure 1 shows the annual response rate since September 1993. Since 1993 the number of emergency responses has increased nearly ten-fold, from 18 to 178. Fortunately, few of these responses involved a very serious public health threat. Lancaster County has 22 facilities that participate in the mandatory EPA Risk Management Program because they store sufficient amounts of extremely hazardous substances such as chlorine and ammonia. Lancaster County is also considered by many to be the number one, two hazardous chemical transportation hub in the United States. Many shipments of hazardous materials go through the county by truck, rail, and pipeline each day. According to a Burlington Northern Santa Fe representative, approximately 46,000 shipments of hazardous materials go through the county rail each year. The chances are very high that a serious accident involving hazardous materials will occur in Lincoln or Lancaster County.

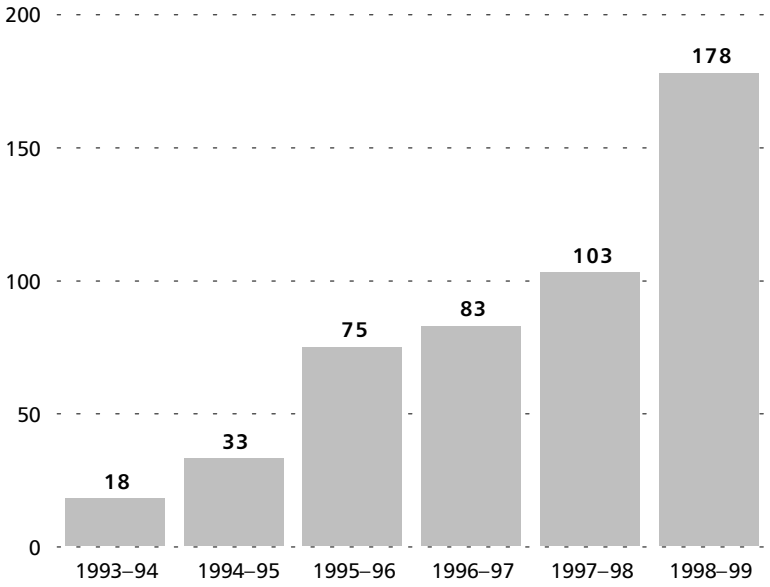

Figure 1: LLCHD Annual Emergency Responses.

Terrorist Threats

Lincoln is among 250 cities identified by the U.S. Departments of Defense and Justice identified as a potential target for terroristic activity. As the seat of state government, the location of a major state educational institution with a nationally recognized football team, and the headquarters of several federal offices, including a federal court house and immigration service office, Lincoln is considered to be a site that would attract terrorist activity. In addition, Lincoln has an abortion clinic that has been the target of controversy in the news and on the Internet. Abortion clinics are high on the list of potential terrorist targets.

Addressing the Public Health Threat

The best defense against the adverse effects of natural disasters, toxic chemical accidents, and terrorist attacks is adequate planning, preparation and exercises. The planning should include methods for rapidly deploying resources that maintain the social fabric of the community and ways to provide information to the community to reduce the adverse effects of the event. The Lancaster County Office of Emergency Management has the responsibility of maintaining a Local Emergency Operating Plan. The Local Emergency Planning Committee, set up under federal Emergency Planning and Community Right to Know Act regulations, has the responsibility for planning for hazardous chemical releases. Both of these bodies bring various sectors of the community together in the planning processes. Public health must remain an integral part of those planning processes.

Health Disparities

When disasters strike a community, those citizens who are at greatest risk are sensitive populations and the homebound, frail, and elderly, who cannot adequately protect themselves. Sensitive populations include people in facilities like hospitals, prisons, nursing homes, and even churches, schools, and recreation facilities – any place where people rely on others to determine their safety. In events involving chemical exposures, in addition to those groups already mentioned, small children and those who suffer from chronic respiratory illnesses become vulnerable to the effects of the chemicals released. Much of the public health risk is dependent on the nature of the disaster, but one thing is certain: a disaster does not choose its victims, and every segment of the population will be adversely affected in some way.

Recommendations

The nature of assuring public health in the event of an emergency is one of making sure that the infrastructure of the community includes adequate resources, skills, planning, and ability to respond effectively in a timely manner. In addition, the community infrastructure needs to be capable of activities that actively monitor the capacity to respond, reduce risk, and prevent potential disasters from occurring. All the recommendations in this area are focused on establishing and maintaining the necessary infrastructure.

Whether disaster events are naturally occurring or human caused, they have a significant impact on public health. It is vital to the community that health issues be addressed through the planning process. Active participation by health professionals in any disaster planning and prevention activities is strongly recommended.

The public health infrastructure must be prepared to reduce the public health risk in the community to the greatest extent possible during a disaster. Agencies and institutions must prepare by

- Assure that personnel are training to work successfully in disaster situations regardless of the type of disaster that occurs.
- Periodically review and update plans and then exercise those plans on a regular basis to assure their continued effectiveness.
- Have the necessary procedures in place to handle mass casualty incidents in a caring and efficient manner.
- Assure adequate equipment necessary to handle any disaster event and sufficient medical supplies will be available in the community to work through the first 48 hours of the disaster.
- Obtain a mobile public health emergency response support vehicle to support field operations in chemical accidents, epidemiological investigations, and natural and manmade disasters and to serve as a mobile coordination center to obtain state and federal assistance.
- Assure adequate epidemiologically trained staff will be available to support on-going investigations and monitoring of health during disaster events.
- Assure that emergency rooms will have the capacity and capability to decontaminate and treat victims of chemical accidents and terrorism.

Notes

Related discussion or indicators are located in the chapters on *Safe Food*, *Water Management*, *Clean Outdoor Air*, *Toxic and Hazardous Materials*, and *Waste Management*.

Table 1

-- Currently no data source.

1. United States Department of Defense, Domestic Preparedness Report, *Defense Against Weapons of Mass Destruction*, 1998.
2. Local Emergency Operations Plan (LEOP) for Lancaster County, August 1996. Revision currently being conducted by Lincoln–Lancaster County of Office Management.
3. Nebraska Emergency Management Agency, *Status of Nebraska Local Emergency Planning Committees*, December 2, 1999. Represents the percentage of counties within Nebraska that have approved plans in place to protect the community.
4. In Lancaster County there are currently no standards developed to assure protection of public health in key areas of training, medical monitoring, incident command, emergency operations, mass casualties, sanitation, shelter, and essential services.
5. Currently no data source. Could be obtained through development of a community surveillance system targeted at various environmental topics.
6. Estimated by LLCHD field staff based on work with RMP, Tier II and transportation modeling. Based on risk analysis using RMP methodology and data from RMP, Tier II, and transportation sources.
7. Nebraska Department of Environmental Quality, *Hazard Screening of Anhydrous Ammonia in Nebraska, June 27, 1995*. 41% of the population in Nebraska are exposed to Anhydrous Ammonia at their place of residence. Greater than 90% of Nebraskans are at risk of exposure to Anhydrous Ammonia due its transport along key transportation corridors.
8. Currently no data source. Could be obtained through development of a community surveillance system, or through a joint effort with the American Red Cross and other organizations that certify individuals in CPR and basic first aid.

Waste Management

Health Objectives for the Year 2010: Reduce the impact on public and environmental health and safety caused by improper disposal, management, or treatment of solid and liquid wastes.

Health Implications

Waste minimization and management were nationally recognized as major priorities for the 1990s. Without improved waste reduction, reuse, and recycling programs established both privately and publicly, health and environmental consequences will likely impact the citizens of Lancaster County. Vector populations (rodents, insects), polluted groundwater, over use of landfills, indiscriminate dumping and littering, overconsumption of resources, fires from improper storage, and the general "trashing" of our environment are consequences of concern to present and future generations.

In recent years, there has been dramatic improvement in Nebraska regarding how we manage solid waste (more commonly called trash). Several years ago, management of solid waste was generally accomplished by disposal in approximately 350 unlicensed open dumps and 35 licensed landfills. These sites were often poorly located, designed, and operated, and many posed a threat to the underlying groundwater. Legislation passed in 1992 shifted the emphasis of solid waste management from a purely disposal-based system to an integrated system that focuses on reducing, recycling, and reusing, as well as safer methods for waste disposal.[1]

The high quality of life in Lincoln and Lancaster County, including the overall cleanliness and beauty, is a community standard, however, standards are always subject to change. Experience in many parts of the United States has shown that as the solid-waste standards of a neighborhood or community decrease, the public tends to lose its willingness to accept personal responsibility for solid-waste problems. Community degradation transcends solid waste to encompass the areas of health, crime, social welfare, and the general economy, thus significantly reducing quality of life. The "broken window" thesis demonstrates that by making improvements, like cleaning up a neighborhood, the whole neighborhood is affected in a positive way.[2]

With Lincoln's and Lancaster County's record of pride in the living environs, it is hoped that government and citizens will continue to rally to develop and utilize innovative waste minimization and management programs, thereby protecting our local health, well being, safety, and environment. The Bluff Road Landfill has been designed and main-

Table 1. Waste Management Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Waste minimization						
Percent of households participating in recycling	--[1]	80.0	--	--	--	--
Landfill utilization (pounds per capita per year)	2431[2]	2300.0	--	--	--	--
Waste collection and treatment						
Illegal waste dumpings reported per year	210[3]	105.0	--	--	--	--
Number of garbage complaints received per year	860[4]	430.0	--	--	--	--
Liquid waste treated (gallons per year per capita per day)	125[2]	113.0	--	--	--	--
Percent reduction of litter on streets and right of ways	--[5]	25.0	--	--	--	--
Percent of households with no garbage service	--[6]	0	--	--	--	--
Public awareness						
Percent aware of storm drain pollution prevention measures	--[1]	75.0	--	--	--	--
Percent of people who report they recently littered	--[7]	5.0	--	--	--	--

tained to avoid environmental pollution.

The following key issues and programs will be discussed under Current Status and Trends: landfill, recycling, waste reduction, yard waste composting, refuse-hauling services, garbage complaints, limited landfills, construction site waste, Keep Lincoln and Lancaster County Beautiful program, non-point source pollution, illegal dumping, cleanup activities, litter reduction, environmental education, and environmental awards.

The topics of toxic reduction, pollution prevention, hazardous material risk reduction, and special waste are addressed in Healthy People 2010 Toxic and Hazardous Materials.

Current Status and Trends

In 1991, the Environmental Protection Agency (EPA) promulgated stringent environmental regulations for municipal solid waste (MSW) management in landfills.[3] Prior to that time, EPA's focus had been on treatment of hazardous wastes while MSW was much less regulated, creating problems such as groundwater contamination and landfill gas migration.

These EPA rules were adopted by the Nebraska Department of Environmental Quality, with additional legislation (LB 1257, the Integrated Solid Waste Management Act) requiring local government to become more responsible for managing solid waste in their respective communities. The state's Integrated Solid Waste Management Act requires local governments to develop solid waste management plans, set prohibitions against disposal of "banned" waste items in landfills, and establish incremental recycling goals.[4]

The result of this legislation was the closure of old landfills, a reduction in certain hazardous waste (oil, batteries) entering landfills, an increase in recycling, and conservation of existing landfill space. While these significant improvements have greatly benefited both the environment and public health, the cost of solid waste management has increased dramatically in Nebraska and nationally.

In 1990 the average annual expenditure for solid waste management programs was $2.1 million compared to $6.5 million in 1999.[5] This increase in expenditures for solid waste management is a direct result of additional emphasis toward environmental protection standards and developing waste recycling and reduction programs. The tipping charge (fee per ton or load) at Lincoln's solid waste disposal sites fund numerous allied solid-waste management efforts in addition to the landfill operation. These include recycling drop-off sites, recycling education, recycling technical assistance, yard waste composting, closure of the North 48th Street Landfill, household hazardous waste collections, special waste management and technical assistance, and illegal dumpsite cleanups.

In FY 1988–89 the per capita disposal of waste was 2,506 pounds per year. Ten years later, in FY 1998–99, with an estimated 286,322 tons of waste deposited in the Bluff Road Landfill, the per capita amount is 2,431 pounds per year.[5] This represents a 3% decrease in the disposal rate per capita. The per capita disposal rate has fluctuated from year to year over the last decade. The overall decrease is attributed to a number of factors. This includes increased recycling by businesses and individuals, and improvements in packaging called "light-weighting," which has reduced the weight of packaging. Increased emphasis on waste reduction by area businesses has also played a role.

Population in the county over the ten-

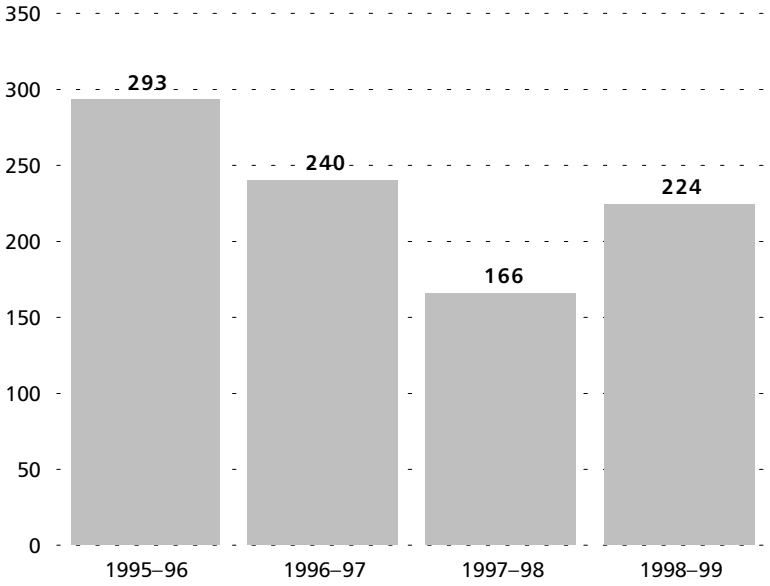

Figure 1: Illegal dumping and clean-up referrals.[1]

year period increased 11.3% to an estimated 235,539 people. However, with the improved economy and resulting increased economic activity the overall per capita disposal rate may have reached its low point and appears now to be increasing slightly.

In FY 1997–98, the municipal solid waste that includes the residential and commercial waste disposed of in the Bluff Road Landfill plus the amount of traditional materials recycled and composted by the public and private sectors totaled approximately 449,375 tons. Of this total, 280,000 tons, or 62.3% of the waste, was landfilled, and 169,375 tons, or 37.7%, was recycled.[5] Although the City and County continue to rely on the landfill as the principal means of managing waste, recycling and composting have become important elements in the solid waste management system.

Additional recycling and waste diversion practices are also operating in the County. In FY 1997–98 more construction and demolition (C & D) debris was recycled by the private sector than was disposed of in the C & D landfill. Approximately 232,800 tons of concrete and asphalt were recycled by the private sector compared to 88,341 tons disposed of in the 48th Street C & D landfill. More than 28,903 tons of sewage sludge (biosolids) were reused by farms as a fertilizer in the same period. Wood debris from the October 1997 snowstorm were recovered for beneficial use rather than burning or burying it as waste. The storm generated the equivalent of one year's worth of municipal solid waste at the sanitary landfill. It was shredded into more than 23,000 dump-truck loads of wood chips that were used in a beneficial manner in the county.[5]

Future trends in solid waste management for Lincoln and Lancaster County will likely include continued emphasis on toxicity reduction, increased residential and commercial recycling; continued closure and environmental monitoring of the North 48th Street Landfill; utilization of landfill gas at the Bluff Road Landfill; and continued development, long-term responsible management and maintenance, of the Bluff Road Landfill.

Residential refuse collection service in Lancaster County is provided by independent refuse hauler businesses. Garbage service is not mandated by local code for all households. Solid and liquid waste hauling businesses are permitted by LLCHD.[6] An annual inspection of the waste hauling vehicles reduces the chance of spillage during transport of the waste. A national trend is the consolidation of waste management firms; that is, the percentage of small hauling businesses and municipal collection systems are decreasing, and many sanitary landfills are being privatized as well. In Lancaster County, however, maintaining high standards of private service by the haulers and high standards for quality control of landfill operations is important.

Accumulation of garbage, improper garbage storage, rodent/insect problems, and other public health nuisances are handled on a complaint basis. In 1998–99 LLCHD received 1,264 complaints to investigate.[7] If a property owner fails to remove garbage after

receiving a five-day notice from LLCHD, the condition is abated. All costs associated with the abatement are then assessed to the property. These efforts reduce infestations of rodents and insects, access to garbage by animals and people, and litter.

Construction sites create multiple waste management issues. Lincoln and other communities in the county have an ongoing trend of growth, and the construction industry has been stretched to meet the needs. Material waste and refuse from construction sites that are not properly contained create litter problems. Adequate toilet facilities need to be provided to prevent unhealthy sanitation practices. Sediment erosion into streets and storm drains creates a major source of non-point source pollution. Each of these issues must be addressed through education and enforcement, as needed.

The Keep Lincoln and Lancaster Beautiful Program has evolved from the Lincoln–Lancaster County Clean Community System program, which began in 1982. It is an affiliate of the Keep America Beautiful organization and uses a behavior-based systems approach to changing attitudes and practices related to proper solid waste management – objective information, citizen involvement, and a focus on results and positive reinforcement.[8] This program coordinates the non-point source pollution stenciling project, the campaign for reporting illegal dumping, the neighborhood and mini-grant cleanups, litter and illegal dumping reduction education, and the annual Lincoln and Lancaster County Environmental Awards Program.

Non-point source pollution (NPSP) is pollution found in water running off streets, parking lots, and lawns into storm drains. NPSP is the major cause of pollution in our nation's lakes and streams. To educate the public, a storm drain stenciling program was started in 1994, where inlets are stenciled with "No Dumping, Leads to Stream." Approximately 7,000 inlets have been stenciled by volunteers from 1994 to 1999. Homes near newly stenciled sites receive a fish-shaped door hanger explaining what NPSP is and how to avoid contributing to it. The stenciling effort resulted in a permanent approach in 1997. All newly installed inlets are required to have the "No Dumping, Leads to Stream" message imprinted into the concrete.

In 1996 an educational campaign was started to address the problem of illegal dumping. A local task force developed a strategic plan, including increasing public awareness, improving reporting of dumping incidents, and aggressive enforcement. Four reusable billboards were designed encouraging people to report illegal dumpers. Three of these were adapted into bumper stickers to be used on county vehicles and sheriff cars. Improvements were made for the surveillance, reporting and timely clean up of these sites. Reported illegal dumping has decreased 23% from FY 1995–96 to FY 1998–99.[7] In 1999 signs were developed for installation on county roads at locations with repeated incidences of illegal dumping, at the city limits of Lincoln, and at the Lancaster County lines. Enforcement is pursued in every situation possible.

An annual grant from NDEQ has provided funding for cleanup mini-grants as an incentive to clean up litter on public land. In FY 1998–99, 2,654 volunteers cleaned up 228.5 tons of waste. Twenty-three mini-grants were awarded to neighborhood associations, villages, families, groups, and organizations.[6] Cleanup to reduce litter is an important focus in helping keep our communities clean and healthy.

A trend of concern is that as children become teenagers, they appear to lose their value of caring for the environment. A severe and ongoing litter

problem exists at most high schools in Lincoln. Talks with school administrators have provided little success and usually resulted in increased cleanup by maintenance personnel rather than behavioral modification of the students. A strong high-school environmental educational program and a peer-driven program for maintaining clean schools are needed.

Since 1993 the Star City Holiday Parade has been promoted as a litter-free event. Sixty sidewalk volunteers educate the crowds and make it easy for people to properly dispose of their litter. Up to 80 additional volunteers form a parade walking unit that presents the "litter free" message in a fun and festive way.

The trend from paper to plastic shopping bags has increased the problem of litter in the environment, especially at the landfill and in commercial areas. These nonbiodegradable, lightweight plastic bags are easily picked up by the wind and carried great distances.

Since 1995 the Earth Wellness Festival annually provides nearly 3,000 Lancaster County fifth-graders with hands-on environmental educational experiences relating to the land, water, air, and living resources. Fifteen representatives from 11 agencies serve on the steering committee to organize this event and 300 volunteers make it happen.

Recognition of those who exemplify environmental stewardship in the community is the focus of the annual Lincoln and Lancaster County Environmental Awards Program. Each April, near or on Earth Day, this award program recognizes both large and small businesses, individuals, educators, and residential developers for their positive efforts that impact our environment.

Health Disparities

Because refuse service is not automatic nor required for single family homes or duplexes, many rental residences do not have refuse service. This reflects most strongly on the low-income populations in Lincoln. An attempt to change state statute to allow Lincoln to require refuse service for all rental residential property failed to pass in 1999, but will continue to be pursued by the City of Lincoln.

The report "Minority Community Environmental Health Hazards Risk Survey" identified that persons of racial or ethnic minority had strong interest in basic environmental health issues such as sanitation.[9] Outreach and education programs that address basic environmental health issues, such as refuse storage and disposal, insect control, rodent control, and recycling, all should be developed.

Public Health Infrastructure

Statistical information is gathered annually for reports and record keeping. This includes solid waste nuisance complaint data, landfill data, wastewater treatment facilities data, and recycling data. Lincoln ordinances and County resolutions are reviewed and updated as needed to maintain the level of regulation required to maintain the public health related to waste. State statute revisions will be proposed to allow Lincoln and Lancaster County to address waste issues. LLCHD policies and procedures will be maintained to assure adherence to policies as approved by the Board of Health. A community survey should be completed to provide data on the indicators selected.

Recommendations

- Keep the per capita waste disposal at or below the existing level.
- Revise the Lincoln Solid Waste Plan in cooperation with Lincoln Public Works and Utilities.
- Enhance end-market opportunities to separate materials for recycling.
- Encourage resource conservation through economic development opportunities.
- Encourage recycling by reducing the cost of curbside recycling services.
- Establish additional Recycling drop-off sites.
- Strengthen end use in the region for land application of bio-solids and beneficial use of yard waste compost.
- Revise the Lincoln Solid Waste Code (Lincoln Municipal Code 8.32).
- Revise or delete the Limited Landfill permitting requirements in the Health Code.
- Educate about and enforce littering violations at construction sites.
- Implement construction-site best management practices as a means to enhance surface water quality by reducing soil erosion.
- Assure adequate toilet facilities are available at construction sites.
- Maintain the behavior-based systematic approach to changing attitudes and practices related to proper solid waste management, using objective information, citizen involvement, and a focus on results and positive reinforcement.
- Adopt an ordinance that requires mandatory collection for household refuse on rental residential properties.
- Continue the shift of solid/liquid waste enforcement from re-active to pro-active.
- Identify and clean up any remaining dump sites in Lancaster County.
- Develop and maintain a system of education, enforcement, and clean up, to address the problem of illegal dumping. This includes dumping in the county right-of-ways, at recycling sites, at parks, and in other people's dumpsters.
- Provide education and information to the public to inform them of proper disposal requirements or recommendations for waste, such as household hazardous waste, old tires, old appliances, and lawn waste (grass and leaves).
- Promote the behavior-based systems approach to changing attitudes and practices at high schools to reduce their litter problem.
- Encourage household usage of reusable shopping bags.
- Continue to promote environmental awareness and commitment through expanded school curriculum, public information programs, publicity, special events, minority community centers and organizations, legislative action, and special-interest groups.
- Establish a community-lead outreach program on home environmental issues with minority community groups.
- Assure recycling opportunities are made available and located in cooperation with minority community centers and organizations.
- Promote a "mini-grant" or barter system for cleanup, education, and recycling activities with minority community centers.

Notes

Related discussion or indicators are located in the chapters on *Toxic and Hazardous Materials* and *Public Health Emergency Management*.

Table 1

-- Currently no data source.

1. Currently no data source. Could be obtained through community surveys or development of a community surveillance system. Recycling should be defined as people surveyed who report routinely recycling at least three of the following recyclables: newspapers, aluminum cans, tin cans, glass, milk and pop plastic bottles, or mixed/office paper.
2. Dept. of Public Works and Utilities, City of Lincoln. 1998–99 calculation of the total amount of waste received at the county landfill, divided by the population in Lancaster County.
3. Includes only illegal dumping on public property referred for clean up by Lincoln–Lancaster County Health Dept. (LLCHD), combined three year average for 1996–97, 1997–98, and 1998–99.
4. Lincoln–Lancaster County Health Dept. Data (LLCHD), combined three year average for 1996–97, 1997–98, and 1998–99.
5. Currently no data source. Could be obtained from current photometric survey data or future litter survey index data collected by the Keep Lincoln–Lancaster County Beautiful Program.
6. Currently no data source. Could be obtained through development of community surveillance system or through joint efforts with garbage removal services in each community.
7. Currently no data source. Could be obtained through community survey including a question such as,"In the past 30 days have you dropped litter, including cigarette butts, on city sidewalks, streets, parking lots, parks, or other people's property."

Figure 1

1. Lincoln–Lancaster County Health Department data.

Narrative sources

1. Nebraska's Environment 1997 – 25 Years of Environmental Programs, Nebraska Department of Environmental Quality
2. George L. Kelling and Catherine M. Coles, *Fixing Broken Windows*, (New York: Simon and Schuster, 1996).
3. Environmental Protection Agency – 40 CFR 258
4. Integrated Solid Waste Management Act (NRSS 13-2001 through 13-2043), Nebraska Department of Environmental Quality, 1200 N Street Suite 400, Lincoln NE 68509, phone 402-471-2186, <www.deq.state.ne.us>
5. Lincoln Public Works and Utilities – Solid Waste Operations, 6001 Bluff Road, Lincoln NE 68517.
6. Lincoln Municipal Code 8.32.
7. Lincoln–Lancaster County Health Department data.
8. Keep America Beautiful, Inc., 1010 Washington Blvd., Stamford, CT 06901, phone 202-323-8987, <www.kab.org>
9. Environmental Health Hazard Risks in the Minority Community, Lincoln, NE, by Rodrigo F. Cantarero, Ph.D. and Blanca E. Ramirez, M.C.R.P.

Animal Control

Health Objectives for the Year 2010: Reduce injury and deaths associated with animal bites and attacks. Reduce behavior of molesting, abusing, and neglecting animals. Increase public health and safety by educating the public regarding responsible pet ownership and by enforcing of local ordinances.

Health Implications

Animal Bites

Each year, animal attack injuries result in approximately 12 human deaths in the United States. The Center for Disease Control (CDC) reported 279 fatalities between 1979 and 1994. In 1995 there were 11 deaths and 14 in 1996. For the 1979–96 period, 3 deaths were documented deaths in Nebraska.[1] None have occurred in Lincoln. CDC and the Insurance Information Institute has also highlighted the following:

1. Dog bites are the number one public health problem of children, ahead of measles and mumps combined. More than half of all children 12 and younger have been bitten by a dog. Children are the victims in 60% of the dog bites.[2]
2. Reported dog attacks have increased at a rate of 2% annually and 37% from 1986 to 1994.[2]
3. Every 40 seconds someone in the United States seeks medical care because of a dog bite. About 4.5 million injuries occur from dog bites in the United States every year, with 800,000 requiring medical treatment.[2]
4. Insurance companies paid an estimated $250 million in dog bite liability claims in 1996. State Farm Insurance Companies reported more than 11,000 dog-bite claims and more than $80 million paid out in liability claims in 1997. The average insurance liability claim per dog bite cost is $12,000.[2]
5. The chances of being bitten by a dog in 1999 are 1 in 50. The chances that the victim of a fatal dog attack will be a burglar are 1 in 777 but the chances it will be a child are 7 in 10.[2]

Additionally, in the January 20, 1999 issue of the *Journal of the American Medical Association*, CDC, in a letter to the editor, stated that of dog-bite injuries resulting in hospital charges, direct medical charges are estimated at $164.9 million and represent only 65% to 70% of the total cost of injury.

Rabies, a potentially fatal disease, is a possible threat from animal bites. The incidence of rabies deaths is low in the United States, yet each year approximately 16,000–25,000 persons receive prophylaxis.[2] In the Midwest, skunks are the primary carrier of rabies. However,

Table 1: Animal Control Indicators

All indicators are rates per 100,000 persons	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Health Status						
Animal bites (Lincoln, human victims only)	225.0[1]	210.0	--	--	--	--
Animal bites (Lincoln and Lancaster County, human victims only)	259.0[2]	210.0	--	--	--	--
All reported animal bites (Lincoln, animal and human victims)	256.0[1]	240.0	--	--	--	--
Cruelty/Neglect calls (Lincoln)	434.0[3]	400.0	--	--	--	--
Emergency room visits for nonfatal dog bites, injuries among children 9 and younger (Lincoln and Lancaster County)	226.0[4]	190.0	--	--	325.0[5]	280.0[6]
Risk Reduction						
Educational Presentations (Lincoln)	44.5[1]	200.0	--	--	--	--
Licensed and rabies-vaccinated dogs and cats (Lincoln)	20,945.0[1]	27,300.0	--	--	--	--
Percent of dogs and cats spayed or neutered (Lincoln)	79.5[7]	85.0	--	--	57.4[8]	--

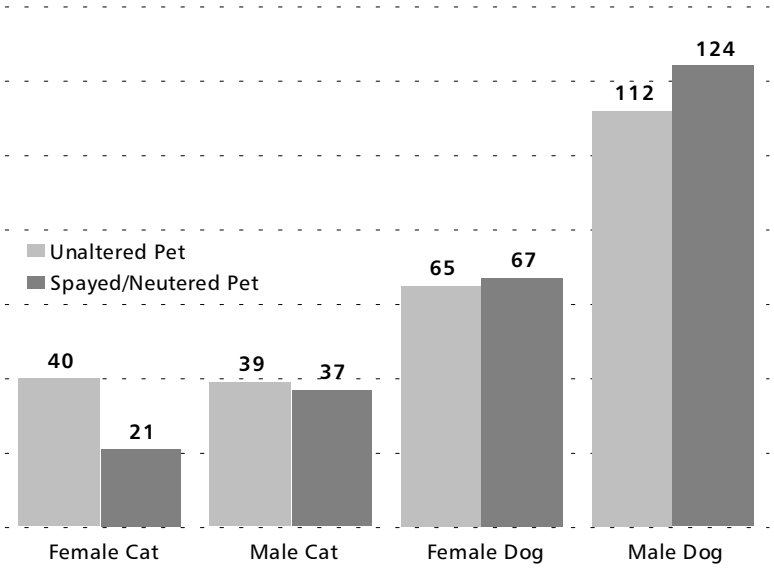

Figure 1: Bites by sex of animal, City of Lincoln, FY 1999. Although a higher frequency of bites are from altered dogs, more than twice as many dogs are altered as unaltered. Thus, bite rates for altered dogs are far lower than for unaltered dogs.[1]

an extremely aggressive form of raccoon rabies became epizootic in the eastern states during the late 1990s and has moved into eastern Ohio as of 1999. This may become a factor locally some time in the next five to six years. In addition to rabies, animal bites can be the source of viral and bacterial infections, psychological trauma, disfigurement, and scarring.

The risk of animal-bite injuries are influenced by several factors. The disposition or temperament of the animal, the age and sex of the victim and animal, and an individual's occupation can influence animal-bite risk.

A reduction in the risk of disease and injury can be realized by the control of dangerous and vicious dogs, enforcement of animal control ordinances, and vaccination of pets. Educational programs emphasizing pet owner responsibility and ownership are effective means of risk reduction.

Animal Abuse and Violence

Many recent studies have shown a correlation or link between animal cruelty and domestic violence. Between 20% and 57% of victims with animals reported their batterers had actually hurt or killed their animals (based on studies of battered women in shelters and those seeking protection orders).[4] In a survey completed in Utah shelters of women with and without children, more than half said their pet was hurt or killed by the abusive partner. Additionally, in 60% of the cases, children in the home witnessed the animal abuse and over half tried to intervene.[5]

In the aftermath of school violence, the U.S. Department of Education listed 16 early behavioral and emotional signs that may suggest a child could become violent. One of the signs is "Past history of violent and aggressive behavior, including animal cruelty and arson."[6]

The American Society for the Prevention of Cruelty to Animals (ASPCA) has listed the following three items as the most common types of domestic violence and animal abuse:

- An adult threatens or carries out animal abuse in order to prevent another household member from telling others that he or she is a victim of domestic violence or to coerce him or her in to taking some action.[7]
- A child abuses an animal as a result of being a victim of or witness to domestic violence.[7]
- An abused animal injures a person (such as a bite).[7]

Dr. Randy Lockwood, psychologist for the Humane Society of the United States, has stated "Animal abuse is a serious crime in itself, but it is also a well documented predictor and indicator of other violence, including domestic violence, teen violence, and other serious crime."[4]

Communicable Diseases

Other Public Health/Animal Control issues have been the increasing awareness and recognition or discovery of new and old zoonoses and the reporting of cases nationally, in Nebraska, or in surrounding states. A zoonotic disease is defined as a disease transmitted from animals to humans. These zoonoses

include Hanta virus, plague, Lyme disease, Psittacosis, and Baylisascaris procyonis (raccoon roundworm), and others. While they have not been reported in Lincoln, they are a potential public health issue for citizens and staff who may come in contact with the spreading vector.

Current Status and Trends

Animal Bites

Every day in the United States, dogs inflict an estimated 900 bites or wounds that subsequently require emergency room care.[2] It is estimated that only 50% of all bites are reported. Additionally, there is very limited data on other species of animals inflicting bites.

In fiscal year 1990 (September 1, 1989 through August 31, 1990), 497 bites inflicted on humans were reported and investigated in Lincoln, Nebraska.[8] In fiscal year 1999, 489 bites (a 1.6% decrease for the nine-year period) were reported.[9] It should be noted that the estimated human population of Lincoln for the same period has grown 11.5%. However, a ten-year comparison (fiscal year 1989 reported 423 bites)[8] indicates a 15.6% increase in bites whereas the human population grew at approximately 14%. The increase is thought to be primarily due to the increase in animal population and the keeping of larger working or guard-dog breeds.

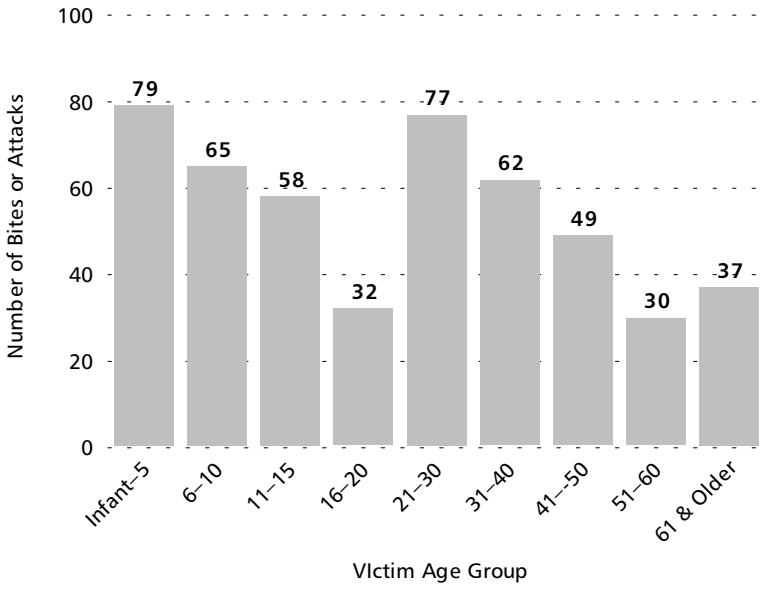

Figure 2: Age of bite victim, City of Lincoln, FY 1999. Of the 489 human victims, 50.1% were females and 49.9% were males in FY 1999 as compared to 46.5% females and 53.5% males in FY 1998.

As of this date no fatalities have occurred in Lincoln or Lancaster County since 1976 (it is not known if there were any fatalities from animal bites prior to that date).

For 1994–95 Lincoln hospitals reported 0.8% of emergency room visits were animal bites.[12] In the United States (1990), animal bites account for 0.5% to 1.5% of emergency room visits.[11] Injuries inflicted by bites vary from simple puncture wounds to severe lacerations.[7] Children, due to their size, are most likely to be bit on the head, face, or neck. Adults generally suffer wounds to the hands, upper arms, lower legs, and thighs. In the United States. children aged five to nine have the highest incident rate.[10] For the period of 1992–95, 22.6 children per 10,000 under age ten were treated in emergency rooms for animal bites.[12] In Lincoln, children from infancy to five years of age received 18.1% of the reported animal bites inflicted to humans in 1998, while the age group six to ten years, 16.7%.[9] Thus 34.8 % of the bites were incurred by young children as compared to the next highest age group, 21 to 30 years, which received 17.6%.[9]

By cooperative agreement, LLCHD's Animal Control Division monitors and investigates all bite injuries treated at Lincoln hospitals or reported by citizens, the Lincoln Police Department, Capital Humane Society, and other law enforcement agencies. Thirty-seven percent of the 1998 bites were reported to Animal Control by emergency room personnel and 57% were reported by the victims or relatives.[9]

Of all animal bites reported in Lincoln in 1998, 72.2% were inflicted by dogs, 22.2% by cats, and 5.6% by other animals.[9] This is fairly comparable with 1990, which had 69.3% dog bites, 23.0% cat bites, and 7.7% other animal bites.[8] Animals that have been neutered or spayed have the lowest frequency of bites. Unaltered male dogs are involved in bite incidents three times more often.

In 1989, the Nebraska Legislature passed dangerous-dog legislation. In 1991 the Lincoln Municipal Code was revised to be similar to but more restrictive than the state statutes. These laws provide enforcement and declaration capabilities to monitor and control dogs that are considered potentially dangerous, dangerous, or vicious based on their behavior and aggression patterns. In addition, Nebraska State Statutes and Lincoln Municipal Code stipulate that dogs, cats, and ferrets involved in bite incidents must be placed under ten-day observation.

In summary, based on reported bites in 1998 and prior years, the typical profile of a Lincoln bite incident is as follows:

1. The victim is a male or female child between the ages of 1 and 15.[9]
2. The biter dog is a guard dog/working breed and aged two years or less (highest probability is one year or less).[9]
3. The dog is unaltered, vaccinated for rabies, and licensed.[9]
4. The dog inflicts a single wound or puncture while on the dog owner's property (highest probability inside the home).[9]
5. The bite is most likely to happen during cooler months of the year such as May or September, when both humans and dogs are most active.[9]
6. The attack is considered unprovoked.[9]

Animal bites are tracked locally and nationally by other animal control agencies. There is no state or federally mandated requirement that they have to be reported to any state or federal agencies.

Animal Abuse and Violence

Understanding the relationship of domestic violence and animal abuse is relatively new, so little documentation exists. Animal abuse is one of several factors now considered as an indicator of domestic violence. Animal abuse and neglect complaints over the past ten years have varied from a high of 1,025 in 1990 to a low of 706 in 1988, with 833 reported in 1998.[8,9] The vast majority of these cases are neglect situations where a dog has been reportedly left without food, water, or shelter. However, two cases in 1999 indicate that the relationship of animal abuse to domestic violence does exist in Lincoln. In the first case, a puppy's throat was slit when a female friend of the owner found out the owner was going to give the puppy to another woman. In the second incident, a woman asked her male friend who had been drinking alcohol to leave her residence. The man, while leaving the residence, picked up a puppy that was outside and threw it to the ground, breaking one of its rear legs. In both cases, the individuals who committed the offenses were cited.

Although cruelty/neglect calls are predominantly for neglect (such as food, water, and shelter), they do provide a gauge of how the general community treats animals and the level of citizen concern for their own or neighbors' animals. There is no documentation of what type of animal abuse or cruelty can be ignored as a factor in domestic violence. If a new ordinance is passed, it may make it possible to separate neglect from the more serious cruelty/animal abuse, but this may only highlight a

degree of potential for domestic violence. It is hoped the relationship between domestic violence and animal abuse will increase the enforcement community involvement as well as other volunteer and private agencies over the next ten years.

Communicable Disease

The positive testing of rabies is reportable, and in Lincoln the only documented cases in recent years have been in bats, which have not been involved in bites.

Health Disparities

Animal Control does not maintain race and ethnicity data from bite reports. The court citations and warning/defect tickets do have a field for race, and this is entered into our computer records. Some limited data about race and ethnicity is available for persons issued a citation or warning/defect. However, the information is not sufficient to make any generalizations about animal ownership or risk of animal bites for racial and ethnic minorities. What is clear from the data is that children are at significant risk for injury from animal bites. They are more likely to be bitten, and their bites are more likely to be serious.

Public Health Infrastructure

Public health infrastructure needs include:

1. Improved reporting of animal bites at the state and national level.
2. Preparedness to monitor new zoonotic diseases as they occur in this community.
3. Improved and refined use of computer technology to increase efficiency and provide regular reports to the public.

Recommendations

The recommendations by the CDC to prevent bites and fatalities, stop the spread of rabies, and decrease the ownership of aggressive animals have been reviewed for local application. They are measurable and provide comparison to past and current records.

Educational presentations reach audiences that include those who may be aware of animal abuse or domestic violence. Information and positive contact with responsible adults can positively influence children. Presentations promote pet-owner responsibility, awareness of proper animal care and treatment, spaying/neutering of pets, vaccination and licensing, and bite prevention. These recommendations and the targets proposed are believed achievable based on past experience.

- By 2005, expand animal control enforcement and education programming throughout all of Lancaster County and decrease animal-related contacts by the Sheriff's Department by fully funding all components of LLCHD's Animal Control education program.
- Implement the three categories of strategies developed by CDC to prevent dog bites beginning in Fiscal Year 2000.

  1. Owner and public education: pet-owner and non-pet-owner education, altering of pets, and school-based education.
  2. Animal Control at the community level: more stringent animal control laws and enforcement.

3. Bite reporting: evaluation of prevention efforts and improve data collection.

- Implement innovative service, education, and enforcement concepts within a city-county animal control program.
- Continue the strong working relationship with the Capital Humane Society, including the kenneling of animals, development of mutual goals, and collaboration with other private groups to encourage the altering of pets.
- Develop concepts for reporting animal abuses and preventing domestic violence, including ideas that may require legislative action.
- Monitor the need to develop a reporting method for zoonoses.

Notes

Table 1

-- Currently no data source.

1. Lincoln–Lancaster County Health Dept., Animal Control Div., *Animal Control Annual Report*, Lincoln NE, 1999. FY 98–99 data.
2. Bob Downey, Dir., Capital Humane Society reported data, Lincoln NE, 1998 data.
3. Lincoln–Lancaster County Health Dept., Environmental Health Div., Animal Control Div., *Animal Control Update Report*, 1990.
4. Lancaster County E-coded emergency room data, 1992–95.
5. Emergency Dept., National Hospital Ambulatory Medical Care Survey, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1992–94 data.
6. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
7. Percent of dogs and cats (licensed and unlicensed) in Animal Control Licensing Files. Lincoln–Lancaster County Health Dept., Animal Control Div., *Animal Control Annual Report*, 1999. FY 98–99 data.
8. Data is based on household survey across United States, thus it is a percentage of altered dogs and cats per household. National Council on Pet Population Study and Policy, Shelter Relinquishment Data, March 1990. Presentation given to Society of Animal Welfare Administrators, Washington D.C.

Figure 1

1. The computer records indicate the following: cats unaltered = 7.6%
   cats altered = 92.4%
   dogs unaltered = 27.6%
   dogs altered = 72.4%

Narrative sources

1. MMWR Dog Bite Related Fatalities U.S., 1995–1996, vol. 46 no. 21.30, May 1997.
2. AVMA Network, Dog bite prevention media, "dog bite fact sheet," 10 November 1998. Dog bite prevention campaign, "Nipping a problem in the bud," vol. 212. no. 9, May 1, 1998.
3. MMWR Human Rabies Prevention – United States, vol. 48 / no. RR-1, January 8, 1999.
4. Nebraska Domestic Violence Sexual Assault Coalition, May 1999 newsletter.
5. "Animal Cruelty Overlaps With Domestic Abuse," *Salt Lake Tribune*, 30 March 1998.
6. "Reducing Violence In U.S. Schools," *Dispute Resolution Journal*, November 1998. <http://www.adr.org/drj>
7. Family Vision, ASPCA. <http://www.aspca.org/issues>
8. Lincoln–Lancaster County Health Department. Environmental Health Division. Animal Control Program, "Animal Control Update Report," 1990.
9. Lincoln–Lancaster County Health Department, Animal Control Division, "Animal Control Annual Report," 1999.
10. "The News About Dog Bites." *Pittsburgh Parent*, 21 August 1998. <http://www.family.disney.com/Features/family_1998_05/pitt>
11. Jeffery J. Sacks, U.S. Centers for Disease Control, Division of Injury Epidemiology and Control, "Personal Communication," August 1990.
12. Lincoln–Lancaster Country Health Department, E-coded report, 1992–95.

Tobacco Use

Health Objectives for the Year 2010: Reduce disease, disability, and death related to tobacco use and exposure to secondhand smoke by preventing initiation of tobacco use, promoting cessation of tobacco use, reducing exposure to secondhand smoke, and changing social norms and environments that support tobacco use.

Health Implications

Scientific knowledge about the health consequences of tobacco use has increased greatly since the release of the first Surgeon General's Report on Tobacco in 1964. It is well documented that smoking cigarettes causes heart disease; cancers of the lung, larynx, esophagus, pharynx, mouth, and bladder; and chronic lung disease. Cigarette smoking also contributes to cancer of the pancreas, kidney, and cervix. Consequences of smoking during pregnancy include spontaneous abortions, low birthweight, and sudden infant death syndrome. Use of smokeless tobacco causes a number of serious oral health problems, including cancer of the mouth, gum periodontitis, and tooth loss. Cigar use causes cancer of the larynx, mouth, esophagus, and lung. The life expectancy of people who smoke is decreased by an average 14 years.

These tobacco-related diseases result in over 420,000 deaths among adults in the United States per year, representing more than 5,000,000 years of potential life lost. Direct medical costs attributable to smoking total approximately $50 billion per year. Direct medical costs attributable to smoking during pregnancy are approximately $1.4 billion per year. Smoking during pregnancy is estimated to account for 20% to 30% of low birthweight babies. As much as 14% of pre-term deliveries are a result of a mother's smoking, and smoking accounts for up to 10% of all infant deaths.

In Nebraska, more than 2,700 people annually lose their lives as a result of tobacco use. Additionally, hundreds of millions of dollars are drained from the state's economy each year through medical costs, lost productivity, and property damage. Even more disturbing than these statistics is the fact that 35,000 Nebraska children currently younger than 18 will die prematurely from tobacco use.

Exposure to secondhand smoke (environmental tobacco smoke, or ETS) has serious health consequences. Researchers have identified more than 4,000 chemical compounds in tobacco smoke; of these, at least 43 cause cancer in humans and animals. Each year, an estimated 3,000 nonsmoking

Table 1. Tobacco Use Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Percent of adults (18 and older) who smoke cigarettes	22.5[2]	13.0	22.0[3]	--	24.7[4]	13.0
Percent of young people in grades 9–12 who smoked cigarettes in the last 30 days	38.0[5]	15.0	39.0[6]	--	36.4[7]	21.0
Average age of first tobacco use by young people in grades 9–12	12.4[5]	14.0	--	--	12.4[8]	13.4
Percent of children who are regularly exposed to tobacco smoke at home	19.4[2]	<15.0	--	--	27.0[9]	<15.0
Percent of women who smoke cigarettes during pregnancy	15.8[10]	2.0	16.3[11]	--	13.2[12]	2.0
Percent of workplaces (50 or more employees) with a formal smoking policy that prohibits smoking in the workplace	--[13]	100.0	--	--	50.0[14]	100.0
Percent of persons who smoke and received advice to quit smoking by a health provider	--[15]	95.0	--	--	61.0[16]	95.0

Americans die of lung cancer because of exposure to ETS. In addition, 150,000 to 300,000 children suffer from lower respiratory tract infections as a result of exposure to ETS. ETS is also linked to heart disease among adults. According to a 1996 study, 21.9% of U.S. children and adolescents under age 18 (approximately 15 million youth) were exposed to ETS in their homes. ETS is more prevalent than is readily recognized. A 1996 study found that among non-tobacco users, 87.9% showed evidence of exposure to ETS, yet only 37% were aware that they had been exposed.

Current Status and Trends

The prevalence of smoking among adults declined steadily from the mid 1960s through the 1980s. This decline appears to have been based on widespread educational and public health efforts beginning with the publication of the 1964 Surgeon General's Report. However, smoking among adults leveled off in the 1990s. The prevalence of smoking among adults nationally in 1995 was 24.7%. The Nebraska rate in 1997 was 22%, and the Lincoln–Lancaster County rate was 21%. Both state and local adult tobacco-use rates have essentially remained constant in the second half of the decade.

Scientific evidence indicates that tobacco use and addiction usually begins in adolescence and that tobacco use may increase the probability that an adolescent will use other drugs. Nearly 90% of people who smoke started before age 18. Consequently, preventing tobacco use among youth has become a major focus of tobacco-control programs nationally and is a primary goal of Nebraska's and Lincoln–Lancaster County's tobacco programs.

Development and implementation of effective comprehensive community-based strategies to prevent children from starting to use tobacco is critical. After experiencing decreases in youth tobacco use in the 1970s and 1980s, the rate at which children use tobacco has steadily increased in the 1990s. Data from the Centers for Disease Control and Prevention (CDC) Youth Risk Behavior Survey (YRBS) reveal that past-month smoking among 9th to 12th graders rose from 27.5% in 1991 to 36.4% in 1997. The 1997 Nebraska YRBS shows that 39% of this same age group used tobacco within the past month. In Lincoln–Lancaster County the rate was 39.3% for females and 36.4% for males for a combined rate of 38%. This is the first time in the history of the YRBS at Lincoln-Lancaster County that the female tobacco-use rate has been higher than the male rate.

Use by adolescents of smokeless tobacco and cigars has also been steadily rising during the 1990s. Nationally, the past-month smokeless tobacco rate among 9th to 12th graders was 9.3% in 1997 (15.8% among males and 1.5% among females). The past-month cigar rate for the same year and same age group was 22% (31.2% males and 10.8% females). The 1997 smokeless tobacco- use rate among adolescents in Nebraska was 17.1% and in Lincoln-Lancaster County was 12.0%.[1]

Determinants of Initiation of Tobacco Use Among Youth

The five key stages of initiation and establishment of tobacco use among young people are:

1. forming attitudes and beliefs about tobacco
2. first trying tobacco
3. continuing experimentation with tobacco
4. regularly using tobacco
5. becoming addicted to tobacco

Youth are put at increased risk of initiating tobacco use by sociodemographic, environmental, and personal factors. Sociodemographic risk factors include coming from a family with low socioeconomic status. Environmental risk factors include accessibility and availability of tobacco products, cigarette advertising and promotion, price of tobacco products, perceptions that tobacco use is normal, peers' and siblings' use and approval of tobacco, and lack of parental involvement. Personal risk factors include a lower self-image, the belief that tobacco use provides a benefit, and lack of ability (or desire) to refuse offers to use tobacco.

Cigarette advertising plays an important role by affecting young people's perceptions of the pervasiveness, image, and function of smoking. The Food and Drug Administration's (FDA's) 1996 tobacco regulation concluded that although advertising may not be the most important factor in a child's decision to smoke, it is a substantial contributing factor. Brand preference data indicate that teens are nearly three times more likely than adults to smoke the most heavily advertised brands of cigarettes. Besides advertising, the glamorization of tobacco use by the entertainment media also appears to influence teen attitudes about tobacco use.

The price of tobacco products has a large impact on youth smoking. Many studies demonstrate that increases in the price of tobacco products reduce the use of both cigarettes and smokeless tobacco among adults and youth. Economic studies show that a 10% increase in the price of cigarettes will reduce overall smoking among adults by about 4% and among teens by at least 7%. In Nebraska, an aggressive statewide effort is underway to significantly increase the tax on tobacco products.

Young people report many reasons for smoking: to improve their image, especially to impress peers and achieve a sense of identity; to help cope with stress; and to achieve a sense of belonging. These themes are reinforced by the images of tobacco advertising that portray smoking as a popular part of a positive, active, and fun lifestyle. Addiction and the physiological/drug effects of nicotine also are cited by young people as reasons to continue to smoke. In addition, young people report that parents and family have an enormous impact on youth smoking, due both to modeling smokers in the family and to stress related to the family.

Determinants of Maintenance of Tobacco Use

The principal reason for continuation of tobacco use is the addictive nature of tobacco, and that addiction occurs in most smokers during adolescence. A study of high school seniors showed that 44% of daily smokers believed that in five years they would not be smoking, but a follow-up study showed that five to six years later 73% of these persons remained daily smokers. In 1995, 68.2% of current smokers wanted to quit smoking completely. However, estimates indicate that only 2.5% of smokers stop smoking permanently each year.

Tobacco Control Interventions

The focus of efforts to reduce tobacco use in the United States has shifted from smoking cessation for individuals to population-based interventions that emphasize prevention of initiation and reduction of exposure to ETS. This change of emphasis from individual behavior to population-based strategies has come about because tobacco use appears to be susceptible to changes in the social environment.

Evidence from California and Massachusetts has shown that comprehensive programs can be effective in reducing tobacco consumption. Both states increased their cigarette excise taxes and

designated a portion of the revenues for comprehensive tobacco-control programs. Data from these states indicate that:

1. Increasing excise taxes on cigarettes is one of the most cost-effective short-term strategies to reduce tobacco consumption among adults and to prevent initiation among youth.
2. The ability to sustain this reduction in per capita consumption is greater when the tax increase is combined with an aggressive antismoking campaign.

There are six key components of tobacco-use prevention and control interventions:

1. prevention and restriction of minors' access to tobacco
2. treatment of nicotine addiction
3. reduction of exposure to secondhand smoke
4. counteradvertising and promotion
5. economic incentives
6. product regulation

Health Disparities

National data from 1995 reveal several disparities in smoking prevalence among adults. Men (27.0% smoking prevalence) are significantly more likely to smoke than women (22.6%). American Indians/Alaska Natives (36.2%) are more likely to smoke than other racial and ethnic groups. Individuals aged 25 to 44 are more likely to smoke (28.6%) than other age groups. Those with 9 to 11 years of education (37.5%) have significantly higher levels of smoking than individuals with either 0 to 8 years of education or 12 years or more; individuals with 16 or more years of education have the lowest smoking rates (14%). Individuals below the poverty level are significantly more likely to smoke than individuals at or above the poverty level (32.5% vs. 23.8%)

Among adolescents, smoking rates differ between Whites and African Americans. In the 1980s, African-American youth showed markedly lower rates of smoking with rates among white teens more than triple those of African-American teens. In recent years, smoking has started to increase among African-American male teens, but African-American female teens continue to have smoking rates considerably lower. Data from the national YRBS indicate that in 1997, 40% of White high school females were smokers compared to 17% of African-American high school females.

Smokeless tobacco use among adolescents also differs significantly by students' gender and race. In 1997, 15.8% of male high school students used smokeless tobacco, compared to only 1.5% of female high school students. Smokeless tobacco-use rates were 12.2% for non-Hispanic Whites, 2.2% for African Americans, and 5.1% for Hispanics.

Public Health Infrastructure

Each year tobacco use kills more than 2,700 Nebraskans and drains $432 million from the economy. Tobacco-related Medicaid expenses alone cost taxpayers almost $40 million every year. The public health community is coming together as never before to fight this number one preventable cause of death and illness, tobacco. Tobacco Free Coalitions have been established in 12 communities throughout the state, including the Tobacco Free Lincoln

Coalition; health agencies are joining forces to introduce and pass legislation to protect the public from environmental tobacco smoke and to increase the tax on tobacco; and communities are creating comprehensive programs to prevent children from starting to use tobacco. Local health departments have the opportunity to be leaders in implementing comprehensive tobacco prevention plans that address the Four A's of tobacco control: *access*, *appeal*, *affordability*, and *clean air*. The CDC's August 1999 guide, "Best Practices for Comprehensive Tobacco Control Programs," and the Smokeless Nebraska Coalition's November 1999 "Combatting Tobacco Use In Nebraska" provide excellent guidance in developing such comprehensive plans. The Lincoln–Lancaster County Health Department has established itself as an aggressive force in the war on tobacco and will continue to work closely with Nebraska Health and Human Services; Health Education, Inc.; the Lancaster County Medical Society; the Nebraska Dental Association; the American Heart Association; the American Cancer Society; the American Lung Association; the Nebraska Heart Institute, local schools, churches, and health agencies; and others to decrease the rate at which children start to use tobacco and to protect the public from ETS.

It will be necessary to seek funds to create an effective and comprehensive community-wide approach to tobacco prevention, education, and cessation. The Smokeless States Coalition's guide, "Combatting Tobacco Use In Nebraska," suggests that full funding of a comprehensive program requires $14.17 per person, which translates into an annual $3,000,000 necessary for Lincoln. A potential source of funds locally is from the Lincoln Community Endowment. An obvious source of funding at the state level should be from the Health Care Trust Fund, in which monies received by Nebraska from the national tobacco settlement will be deposited.

Recommendations

Implement a community-wide multistrategy approach to reduce the rate at which youth begin to use tobacco and to ensure clean air. This approach will focus on changes in social norms and environments that support tobacco use, policy and regulatory strategies, community participation, strategic use of media, development of local programs, coordination of statewide and local activities, linkage of school-based activities to community activities, and use of surveillance and evaluation techniques to monitor program impact. Specific aspects of this approach include:

- Continue to work with the statewide effort to increase the tax on tobacco significantly enough (by a minimum of 10%) to decrease sales and consumption among both youth and adults.
- Help public and parochial schools implement evidence-based tobacco prevention and education curriculum for grades K–12.
- Work closely with the schools that are part of the Comprehensive School Health Initiative to help them address the youth risk behavior of tobacco use.
- Continue to assist the Lincoln Police Department in conducting compliance checks of tobacco retailers to achieve the goal of no more than a 5% illegal sales rate.
- Involve businesses in the effort to decrease youth and employee tobacco use by encouraging the businesses to implement, promote, and enforce strong clean indoor air policies that comply with the Nebraska Clean Indoor Air Act.

- Encourage all health care providers, including physicians, dentists, and allied health personnel, to ask patients and clients about personal tobacco use, strongly encourage cessation, and provide information on quitting.
- Implement a smoke-free workplace ordinance.
- Enlist media to assist with public education campaigns emphasizing clean indoor air.
- Encourage administrators of health plans to offer treatment of nicotine addiction as part of the health plan provisions.
- Create and implement aggressive counter-advertising campaigns to combat the tobacco industry's extensive advertising and promotion.
- Make cessation programs and support groups widely available and accessible to all desiring such a program, including youth and uninsured/underinsured individuals.

Notes

Related discussion or indicators are located in the chapters on *Maternal and Child Health*, *Healthy Children*, *Chronic Disease*, *Oral Health*, and *Clean Indoor Air*.

Table 1

-- Currently no data source.

1. U.S. Dept. of Health and Human Services. *Healthy People 2010 Objectives: Draft for Public Comment*.
2. Lincoln–Lancaster County Health Dept., Behavioral Risk Factor Survey 1999.
3. Nebraska Health and Human Services System, *Behavioral Risk Factor Surveillance System Report*, 1995–96.
4. U.S. Dept. of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*. Data from the National Health Interview Survey, 1995.
5. Lincoln–Lancaster County Health Dept., Youth Risk Behavior Survey, 1997.
6. The Buffalo Beach Company, *The 1997 Youth Risk Behavior Survey*, Summary Tables of Nebraska Data, 1997.
7. 1997 Youth Risk Behavior Surveillance Data, *MMWR*, vol. 47, no. SS-3.
8. U.S. Dept. of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*. Data is for youth aged 12–17, from the National Household Survey on Drug Abuse, 1996.
9. U.S. Dept. of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*. Data from National Health Interview Survey, 1994.
10. Lincoln–Lancaster County Health Department, Vital Statistics, 1998.
11. Nebraska Health and Human Services System, *Nebraska Vital Statistics Report*, 1998.
12. National Center For Health Statistics, *National Vital Statistic Report*, vol. 47, no. 18. U.S. births data, 1997.
13. Currently no data source. Business survey of smoking policies would need to be developed.
14. U.S. Dept. of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*. Data from the National Survey of Worksite Health Promotion Activities, 1992.
15. Currently no data source. Could be obtained from a community health survey.
16. U.S. Dept. of Health and Human Services, *Healthy People 2010 Objectives: Draft for Public Comment*. 1996 data from the Health Plan Employer data and information set.

Narrative source

1. The Buffalo Beach Company, *The 1997 Youth Risk Behavior Survey*, Summary Tables of Nebraska Data, 1997. In response to the question "Have you ever used chew or snuff in the past 30 days?"

Nutrition and Physical Activity

Health Objectives for the Year 2010: Improve the health, fitness, and quality of life of all Lancaster County residents and reduce their chronic disease risk by promoting regular daily physical activity and optimal nutrition status.

Health Implications

Nutrition

Nutrition is essential for sustenance, growth and development, health, and well-being. At the same time, nutritional (or dietary) factors contribute substantially to the burden of preventable illness and premature death in the United States and, consequently, to the nation's economic burden. For the majority of adults who do not smoke and do not drink excessively, what they eat is the most significant controllable risk factor affecting their long-term health. Dietary factors are associated with five of the ten leading causes of death: coronary heart disease, some types of cancer, stroke, Type 2 diabetes mellitus, and atherosclerosis.

Many factors are involved in the nutrition and health relationship. Chief among these is the disproportionate consumption of foods high in fat, often at the expense of foods high in complex carbohydrates, fiber, and other substances necessary for good health that are found in vegetables, fruits, and grain products. There is much evidence associating high dietary fat intake with increased risk of obesity, some types of cancer, and high blood cholesterol. With today's ready availability of high-fat snacks and fast foods, children and teenagers are likely to consume unhealthy amounts of high-fat foods. This can be a precursor to a lifestyle of poor nutritional habits, putting them at increased risk for chronic disease later in life.

An important dietary factor for good health is adequate intake of vegetables, fruit, and grains as a source of complex carbohydrates and fiber as well as vitamins and minerals. These foods are also generally low in fat. Populations consuming diets rich in these foods have significantly lower rates of cancers of the colon, breast, lung, oral cavity, larynx, esophagus, stomach, bladder, cervix, and pancreas. In addition, a fiber-rich diet may have a protective effect against certain types of cancer, including colon cancer. To aid in increasing dietary fiber and vitamin and mineral consumption, the National Cancer Institute in cooperation with the Produce for Better Health Foundation sponsors the "Five a Day for Better Health Program." This educational effort seeks to increase per capita consump-

Table 1. Nutrition and Physical Activity Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Percent of young people grades 9–12 who engage in vigorous physical activity at least 20 minutes on three or more of the previous seven days	70.4[1]	85.0	64.2[2]	--	63.8[3]	85.0[4]
Percent of young people grades 9–12 who engage in moderate physical activity at least 30 minutes on five or more of the previous seven days[5]	20.0[1]	30.0	18.9[2]	--	20.4[3]	30.0[4]
Percent of people aged 18 and over who engage in any leisure time physical activity	73.4[6]	85.0	77.0[7]	--	72.3[8]	85.0[4]
Percent of people aged 18 and over who engage in "regular and sustained" physical activity[9]	30.4[6]	40.0	20.0[7]	--	20.4[8]	30.0[4]
Percent of population aged 18 and older who are overweight	30.9[6]	15.0	29.0[7]	--	32.4[8]	15.0[4]
Percent of people who meet the Dietary Guidelines average daily goals of no more than 30% calories from fat	--[11]	75.0	--	--	33.0[12]	75.0[13]
Percent of people who meet the Dietary Guidelines minimum average daily goal of at least five servings of vegetables and fruit	--[11]	75.0	--	--	40.0[12]	75.0[13]
Percent of people who meet the Dietary Guidelines recommendations for calcium	--[11]	90.0	--	--	45.0[12]	90.0[13]

tion of fruits and vegetables from the current national average of 2.5 servings per day to at least five servings per day.

Calcium intake in our population is another dietary factor that has long-term implications on health and quality of life issues. Low calcium intake throughout the lifespan appears to be one important risk factor in the development of osteoporosis. This bone disabling disease affects more than 25 million people in the United States and is the major underlying cause of bone fractures in postmenopausal females and the elderly, with more than 1.5 million fractures occurring annually at an estimated cost of $13 billion to $18 billion per year in medical charges and lost productivity from hip fractures alone. Females are especially susceptible to this bone disease. Because peak bone mass is established by the age of 30, calcium consumption is important throughout all age categories to promote bone formation in childhood, teen, and early adult years and to reduce bone loss after the age of 30.

Physical Activity

In addition to proper nutrition, the adoption and maintenance of a physically active lifestyle is an essential part of a healthy life. On average, physically active people outlive those who are inactive. Regular physical activity helps to maintain functional independence of older adults and enhance the quality of life for people of all ages. Physical activity provides some protection against many chronic diseases including coronary heart disease, hypertension, some types of cancer, Type 2 diabetes mellitus, osteoporosis, arthritis, and depression and anxiety. Regular physical activity can also help in management of Type 1 diabetes mellitus, maintaining appropriate body weight, and combating stress.

Physical activity has a wide range of benefits for participants. Physical activity provides some protection against several chronic diseases, and its role in preventing coronary heart disease is of particular importance. Physically inactive people are almost twice as likely to develop coronary heart disease as people who engage in regular physical activity. This risk factor is almost as significant as cigarette smoking, high blood pressure, and high blood cholesterol and is more prevalent than any one of these other risk factors.

The 1990s has brought a new perspective on exercise, fitness, and physical activity by shifting the focus from intensive aerobic exercise to a broader range of health-enhancing physical activity. Research over the past decade has made it clear that virtually all Americans will benefit from regular sustained physical activity. Although vigorous physical activity is necessary for improved cardiovascular fitness, increasing evidence suggests that physical activity that is less intense and accumulated throughout the day can have significant health benefits, including a decreased risk of coronary heart disease, diabetes, osteoporosis, colon cancer, and high blood pressure. For those who are inactive, even small increases in physical activity show measurable health benefits. It is important to develop a pattern of regular physical activity that begins in early childhood and lasts throughout life.

Overweight Americans

A common health objective of both good nutrition and increased physical activity is the reduction in number of Americans who are overweight. Overweight is defined as body weight that exceeds the normal or standard weight for a particular person, based on height and frame size and a body mass index (BMI) of 27.3 for males and 27.8 for females. The prevalence of people in this country who are overweight based on BMI calculations has increased at an alarming rate, so that more than one-third of American adults are now

considered overweight. Obesity is linked to five of the ten leading causes of death in the United States. Of all the diseases for which unhealthy weight is a contributing factor, Type 2 diabetes is most strongly associated with obesity. However, overweight is also a major risk factor for coronary heart disease and hypertension. Certain types of cancer are also linked to overweight. For example, the risk of developing colon cancer is 50% to 70% greater in overweight men compared to those who are lean, with an estimated one in ten colon cancers being attributable to obesity.

The prevalence of overweight is particularly high in minority populations, especially among young women and low-income persons. Furthermore, the increasing prevalence of overweight is not limited to adults but is observed in children above six years of age, in both genders, and in all subpopulations. Morbidity associated with overweight is considerable and will worsen as our population continues to become more overweight. These health problems often can be reversed through proper weight loss and weight maintenance.

Medical researchers have estimated the cost of obesity to be $100 billion annually. This amount includes $45.8 billion in direct costs, such as hospital care and physician services, and another $33 billion for weight reduction services and products. Obesity also costs the economy $18.9 billion a year for such indirect costs as lost output caused by death and disability from weight-related diseases.

Current Status and Trends

Nutrition

Data from 1994 to 1996 reveal that Americans aged two and older consumed about 33% of their total calories from fat, down from 34% in 1994 and 36% in 1980. In addition, the percentage of Americans aged two and older who consumed less than 10% of calories from saturated fat was 35%. (Comparable data is not available for Nebraska or Lancaster County.) However, the 1990 Behavioral Risk Factor Survey has identified Nebraska population segments that are more likely to have high dietary fat intake. "High" fat consumers were defined as those who were above the 75th percentile for fat consumption for the state. Among young men aged 18 to 34, the percentage with high fat intake was much greater, with 45% categorized as "high" fat consumers in Nebraska.

Teenagers were also likely to consume unhealthy amounts of high-fat foods. One-third (34%) of high school students participating in the 1993 National Youth Risk Behavior Study had eaten three or more servings of foods typically high in fat content during the day preceding the survey. Female students (24%) were significantly less likely than male students (42%) to have eaten three or more servings of such foods. Of the Nebraska students, there was an even higher percentage who reported eating three or more servings of high-fat foods the previous day (61%).

Average daily intake of vegetables, fruits, and grain products among people aged two years and over has increased since the start of this decade, as has the proportion of the population who meets the minimum average daily goal. However, the majority still do not meet the recommendation of five or more fruits and vegetables every day. Data from 1996 indicates that only 40% of the population aged two and older met this goal. Nebraska data indicate for adults aged 18 and older that 22% of the population met the Dietary Guidelines' minimum average daily goal of consuming fruits and vegetables five or more times every day. According to the 1993

YRBS, only 15% of American high school students had eaten five or more servings of fruits and vegetables during the day preceding the survey. Boys (18%) were more likely than girls (13%) to have eaten the recommended "Five a Day." Results of Nebraska students were nearly identical to those for the nation. The percentage of Americans aged two or over who meet the Dietary Guidelines' minimum average goal of at least six servings of grain products increased to 52%; however, consumption of whole-grain products remains low.

Since the start of this decade, the proportion of the population who met recommendations for consumption of calcium-rich foods decreased or changed little, with consumption falling short of recommendations for the majority of the population. In 1996, fewer than one in ten females aged 11 to 24 years consumed an average of three or more servings of milk and milk products daily.

Another nutritional trend in this country is eating meals away from home. Studies indicate that 40% of a family's food budget is spent in restaurants and carry-outs. Foods eaten away from home are generally higher in fat, saturated fat, cholesterol, and sodium and lower in fiber and calcium than foods prepared and eaten at home. People may also have a tendency to eat larger amounts when they eat out, eat higher calorie foods, or both.

Physical Activity

With the introduction of the 1996 Surgeon General's Report on Physical Activity and Health came a recognition of the benefits of less intense but accumulated physical activity in addition to the established benefits of vigorous exercise. Unfortunately, few Americans engage in regular physical activity despite the potential benefits. According to the BRFS of Nebraska, 21% of people aged 18 and older reported participating in weekly physical activity, and 23% of people in this same age category reported having no leisure-time physical activity. This compares to national rates of 20% and 28%, respectively. In Lancaster County, 32.5% of residents reported participating in weekly physical activity, while 19% reported having no leisure-time physical activity. Less than 10% of the U.S. population report regular, vigorous physical activity that involves the large muscle groups in dynamic movement for 20 minutes or longer, three or more days per week.

Regular physical activity among youth is important because of health benefits (cardiorespiratory function, lower blood pressure, and weight management) and because the adoption of a physically active lifestyle may continue into adulthood. Data demonstrate that major decreases in vigorous physical activity occur during grades 9–12, and this decrease is more pronounced in girls than boys. Twenty-one percent of young people in grades 9–12 engage in moderate physical activity for at least 30 minutes each day, whereas the national average of young people in grades 9–12 who participate in daily physical education at school is 25%. The Lancaster County rate for this same category is 39%. Nebraska data were not available.

Worksite physical activity and fitness programs provide a mechanism for reaching large numbers of adults. Employer-sponsored programs can be offered on-site or in conjunction with community organizations. Worksite fitness programs have been shown to have at least short-term effectiveness in increasing the physical activity and fitness of program participants. Evidence that worksite programs are cost effective is also growing, and such programs may even reduce employer costs for insurance premiums, disability benefits, and medical expenses. Additional benefits for employers include increased productivity, reduced absenteeism, reduced employee turnover,

improved morale, enhanced company image, and enhanced recruitment. In 1992, approximately 57% of the nation's worksites with 50 or more employees offered employee-sponsored physical activity and fitness programs. In addition, 18% offered some form of nutrition education, and 14% offered weight-management programs.

Overweight Americans

The prevalence of overweight has increased in the United States over the past decade, up from 25% of adults in 1980 to 34% in 1993 (as measured by the National Health and Nutrition Examination Survey). As a result, more than 60 million adult Americans (more women than men) are thought to be overweight. The most recent data for Nebraska shows that 29% are overweight. This prevalence is based on self-reported data from the 1995–96 BRFS and is not comparable to national statistics where data are derived from measured heights and weights.

Health Disparities

The prevalence of overweight is particularly high in minority populations, especially among women and low-income persons. Currently, about 47% of Hispanic and 49% of African-American women are classified as overweight. Studies show that non-Hispanic low-income women have an obesity rate of 39%, compared to 25% for their higher-income-level counterparts. A similar situation exists among Mexican-American women: 46% of the population's low-income women are overweight compared to 40% for those with incomes above the poverty level.

Overweight is a serious health problem for American children and is considered a pediatric epidemic. Childhood obesity has been increasing since the 1970s, with the result that 21% of all 12-year-olds to 19-year-olds are now seriously overweight. A study of 1,456 youths aged 9–12, conducted by the Centers for Disease Control and Prevention between 1988 and 1991, found that one in five preteens is overweight.

Public Health Infrastructure

Physical inactivity and obesity go hand in hand. Ultimately, it is the individual's responsibility to take action to combat personal inactivity and overweight; however, education and environment can be major determinants in whether or not the individual takes positive action.

Public education about long-term health consequences and risks associated with overweight and how to achieve and maintain a preferred weight is necessary. Equally important is establishing an environment that is conducive to safe and pleasurable physical activity. Crime-free neighborhoods, unbroken sidewalks, good lighting, bicycling and walking trails, and pedestrian-friendly streets all encourage leisure-time physical activity. Community initiatives that promote walking or biking to school or work, eating five or more fruits and vegetables each day, and incorporating the Food Guide and Physical Activity Pyramids into daily life can be instrumental in achieving a healthier population. Such initiatives must be embraced by homes, schools, worksites, and the community with the goal of helping citizens establish and maintain healthful behaviors in both diet and physical activity.

Recommendations

- Maintain in the schools an up-to-date quality of nutrition education that utilizes most recent data and technology and ensures that teachers are giving the most current nutritional information.
- Increase the number of schools that teach essential, age-appropriate, current nutrition education topics to all levels of students and throughout the child's entire school career.
- Increase the proportion of children and adolescents who take advantage of school breakfast and lunch programs through positive promotion of these programs.
- Encourage employers to develop a worksite culture that promotes healthful diet and adequate physical activity for employees.
- Develop a community partnership to address ways in which safe and sustained physical activity can be encouraged for the citizens of Lincoln. Partners will include urban planning, law enforcement, health promotion, educators, citizens, employers, public works, trails activists, and others.
- Encourage primary and allied health care providers to routinely assess and counsel their clients to incorporate healthy diet and adequate physical activity into their daily routines.
- Nutrition professionals and nutrition organizations must actively work with legislators and insurance carriers to provide coverage for nutrition education and counseling for clients whose conditions demand appropriate nutrition intervention.
- Consistent physical education in schools must be recognized as an important mechanism to promote increased physical activity in children and adolescents that can carry over into adulthood as lifetime activities for good health.
- Public and private schools should be encouraged to provide access to their physical activity spaces and facilities for young people and adults outside of normal school hours.
- As a community, take advantage of nationally recognized campaigns such as "Five A Day" and "Physical Activity, It's Everywhere You Go," to promote messages of good health to the citizens.

Notes

Related discussion or indicators are located in the chapters on *Maternal and Child Health*, *Healthy Children*, *Older Adults*, and *Oral Health*.

Table 1

-- Currently no data source.

1. Lincoln–Lancaster County Health Department, Youth Risk Behavior Survey, 1997.
2. Buffalo Beach Company, Lincoln, NE. *1997 Summary Tables*, Nebraska Youth Risk Behavior Survey.
3. Centers for Disease Control and Prevention, *MMWR* Surveillance Summary, 47(SS-3), "Youth Risk Behavior Surveillance – United States, 1997."
4. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
5. Percentage of students reporting that they walked or bicycled for at least 30 minutes at a time on five or more days in the past week.
6. Lincoln–Lancaster County Health Department, Behavioral Risk Factor Survey, 1999.
7. Nebraska Health and Human Services System, *Nebraska 1995–1996 Behavioral Risk Factor Surveillance System Report*.
8. National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, *1998 BRFSS Summary Prevalence Report*.
9. "Regular and sustained" physical activity as measured by the Behavioral Risk Factor Survey represents the accumulation of 30

minutes or more of physical activity, five or more days per week.

10. Overweight, as measured by the Behavioral Risk Factor Survey, is a Body Mass Index greater than or equal to 27.8 for men and 27.3 for women.
11. No data currently available. An appropriate data collection method needs to be determined.
12. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1994–1996 data on individuals aged two and older from the Continuing Survey of Food Intake by Individuals, U.S. Department of Agriculture (2-day average).
13. U.S. Department of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. The national objective based on those individuals aged two and older due to data source (see note 12).

Alcohol and Other Drugs

Health Objectives for the Year 2010: Reduce death, injury, and socio-economic consequences of alcohol and other drug abuse. Educate the public on the dangers of alcohol and other drug abuse.

Health Implications

The public health impact of the misuse of alcohol and drugs is extremely significant. It is estimated that 18 million Americans are currently alcohol dependent and an additional 3 million Americans are estimated to have serious drug problems.[1] Approximately 100,000 people die each year in the United States as a result of alcohol abuse alone. Illicit drug abuse and related acquired immunodeficiency syndrome (AIDS) deaths account for another 12,000 deaths. Substance abuse costs every person in the United States nearly $1,000 annually to cover the costs of health care, law enforcement, motor vehicle crashes, crime, and lost productivity.[2]

Many serious health and social problems are also related to substance abuse. Substance abuse has been identified as a cause of cancers that until recently were thought to be unrelated. Alcohol and illicit drug use also increases the risk for heart disease, stroke, and hypertension. Heavy alcohol use increases the risk for hepatitis B and C, cirrhosis, and various other liver disorders. Cocaine use can produce cardiac irregularities and heart failure, convulsions, and seizures. Cocaine use temporarily narrows blood vessels in the brain, contributing to the risk of strokes as well as to cognitive and memory deficits. Long-term use of drugs can also result in chronic depression, sexual dysfunction, and psychosis.[2]

The rate of alcohol-related fatalities has declined since 1987 but still remains a serious problem in the United States. The rate for the United States in 1996 was 6.5 fatalities per 100,000 population, which is down from 9.8 per 100,000 in 1987. Since 1982, the alcohol-related traffic fatality rate for youth has decreased by over 50%. The National Highway Traffic Safety Administration (NHTSA) estimates that since 1975, more than 16,500 lives have been saved by minimum drinking age laws.[2]

Alcohol-related A & B injuries contribute greatly to the use of emergency rooms and health care costs. "A" injuries are defined as disabling, and "B" injuries are defined as visible but not disabling in the injury severity codes reporting system of the Nebraska Department of Roads. In addition to health care costs, these types of injuries often cause families intense emotional and financial strain because the injuries result in permanent disability.[2]

Approximately 20% of all traffic crashes involving a driver under age 21

Table 1. Alcohol and Other Drugs Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Alcohol-related motor vehicle incidents						
Fatalities per 100,000 population	3.3[1]	2.9	6.3[2]	--	6.5[3]	2.9[4]
A & B injuries per 100,000 population	71.6[5]	63.0	70.0[2]	--	121.0[6]	65.0[4]
Crashes per 100,000 population	55.8[5]	48.0	74.7[2]	--	--	--
Percent reporting alcohol use in the past month						
9–12 grade students	48.2[7]	37.0	56.4[8]	--	50.8[9]	--
Percent reporting binge drinking in the past month						
16–20 year-olds	31.6[7]	23.5	42.1[8]	--	33.4[9]	--
18–25 year-olds	26.3[10]	18.0	--	--	32.0[11]	18.0[4]
Percent reporting driving after drinking alcohol in the past month						
16–20 year-olds	--[12]	20.0	--	--	--	--
21–34 year-olds	--[13]	35.0	--	--	--	--
Percent reporting marjuana use in the past month						
9–12 grade students	23.7[7]	15.0	15.6[8]	--	26.2[9]	--
18+ year-olds	--[13]	10.0	--	--	--	--
Percent reporting using inhalants one or more times during lifetime						
9–12 grade students	18.0[7]	9.0	19.9[8]	--	16.0[9]	--
Percent reporting using methamphetamines one or more times during lifetime						
9–12 grade students	--[14]	6.0	--	--	17.0[9]	--
18+ year-olds	--[13]	5.0	--	--	--	--

involves alcohol. Crashes with a driver under age 21 that are attributable to alcohol cost $18.2 billion per year.[10]

Alcohol-related fatal crashes are not limited to drivers and passengers in motor vehicles. Alcohol involvement was reported in 45% of the pedestrian fatalities reported in the nation. Pedestrians were intoxicated in 29% of these fatalities, 12.5% involved drivers who had consumed alcohol, and both the driver and pedestrian were inxtoxicated in 3.5% of the crashes.[9] Approximately $289 million is spent on alcohol-related accidents involving pedestrians and cyclists under the age of 21.[10]

Inhalant use is a popular substance abused by youth in rural areas of the West and Midwest.[2] Inhalant use can cause damage to the heart, kidney, brain, liver, bone marrow, and other organs. Users can also suffer from "sudden sniffing death syndrome," which is a result of the sudden and unexpected disturbances that inhalants have on a heart's rhythm. Inhalant use can be physically and psychologically addictive and cause users to experience withdrawal symptoms.[11]

Methamphetamine speeds up the central nervous system, causing physical and psychological effects. The effects that attract users to meth are an increased level of energy and alertness, decreased need for sleep, a feeling of euphoria, and increased sexuality. These effects seem appealing at first, until users realize that the harmful effects of meth greatly outweigh the benefits. Meth is extremely addictive because users often continue taking the drug to avoid the inevitable crash that comes when the positive effects of meth begin to wear off. Even first-time users can experience many of the meth's negative effects.[13]

Many unintentional injuries also result from substance abuse. Impaired behaviors can lead to injuries resulting from falls, fires, and drownings. Approximately 22% of victims of accidental fatal boating incidents were intoxicated at the time of the accident.[2]

The victims of drug and alcohol abuse are not limited to the user. Fetal alcohol exposure can lead to a plethora of alcohol-related disabling conditions, including fetal alcohol syndrome (FAS). FAS is characterized by poor motor coordination, facial deformities, growth deficiencies, and cognitive and behavior problems.[1] More information on the health implications of FAS can be found in the Maternal and Child Health section of this report. Substance abuse has been identified as a risk factor for abusive and violent behavior, a factor in one-half to two-thirds of homicides, suicides, and serious assaults. There is also a correlation between problem drinking and social problems, such as domestic violence and child abuse and neglect.[2]

The combination of alcohol use and sex can be potentially dangerous. This combination can lead to unintended pregnancies, the spread of human immunodeficiency virus (HIV) and other sexually transmitted diseases (STDs), and unwanted sexual experiences. Alcohol use has also been related to a failure to use condoms. Women are almost twice as likely as men to report having engaged in sexual activities and having abandoned safe-sex techniques when under the influence of alcohol.[3]

Children learn at an early age which drinking behaviors are socially accepted by their community (i.e., where, when, why, how much, and with who). They also learn about the normative standards or expectations held by the community. These expectations will either encourage or inhibit drinking in particular situations. Parents are often reported by adolescents as being the person who offers them their first drink of alcohol, but once alcohol use has been initiated, imitation of one's peers becomes the dominant social influence.[4] Adolescents obtain alcohol most commonly from older siblings and friends, usually at parties. Alcohol at parties is

typically associated with low cost per drink when alcohol is supplied in kegs. Most young adults respond that they would buy for someone younger than them. This is considered to be "returning a favor," since someone once purchased alcohol for them.[5]

Perceived acceptance of alcohol use among family, peers, and society greatly influences youth to use or avoid alcohol.[2] Youth who consume alcohol at an early age are at greater risk of addiction and problems with alcohol later in life. Age of first easy access to alcohol has also been found to relate to higher rates of drinking later in life. Alcohol use among adolescents can lead to physical fights as well as unintended and unsafe sexual activity.[5]

Risk factors that contribute to adolescent initiation to and use of alcohol and other drugs are environmental and community factors (economic and social deprivation, community norms, and standards favorable toward drug use), familial factors (family history of addiction, family management problems, parental drug use, and positive attitudes toward use), and individual factors (friends who use drugs, favorable attitudes toward drug use, school failure, and early age of first use).[6]

Alcohol and drug use at an early age increases one's risk of addiction or problems later in life. First easy access to alcohol at an early age is related to later rates of drinking.[5] Half of the binge drinkers in colleges were already binge drinkers when they were seniors in high school.[7]

As with alcohol use, perceived societal acceptance and expectations of binge drinking can influence youth to participate in this high-risk activity.[2] High school students who participate in binge drinking are likely to continue binge drinking in college or young adulthood.[7] Binge drinking can lead to many problems, including death, motor vehicle incidents, unintentional injuries, unintended and unsafe sexual activity, physical fights, arguments, and academic failure.[7]

Drinking patterns within a population are reflective of policies, institutional structures, and social norms regarding alcohol use and sales within the community. While it is important to see more fundamental change with regard to prevention efforts for risky drinking practices, it is also beneficial to focus on social environments and policies that influence individual attitudes and behaviors surrounding alcohol use.[8]

Current Status and Trends

In 1997, among fatal crashes, 50% involved alcohol in Lancaster County. This total is well above the estimate of 39% alcohol involvement in fatal crashes in the nation and the estimate of 31% for Nebraska. However, for all crashes reported – including not only fatalities, but injury and property damage incidences – both Lancaster County and Nebraska figures estimate only a 4% alcohol involvement. This is less than the national estimate for alcohol-related crashes which is 7% of all crashes.[9]

According to the Youth Risk Behavior Survey (YRBS) in 1997, alcohol use and binge drinking among high school students in Lancaster County were comparable to national averages and lower than Nebraska rates. Binge drinking is defined as having five or more drinks of alcohol in a row within a couple of hours. Alcohol use during the month prior to the survey was reported by 48.2% of students in Lancaster County, and 31.6% reported binge drinking in the month prior to the survey. Nationally, 50.8% of students reported using alcohol and 33.4% reported binge drinking. Nebraska high school students reported 56.4% using

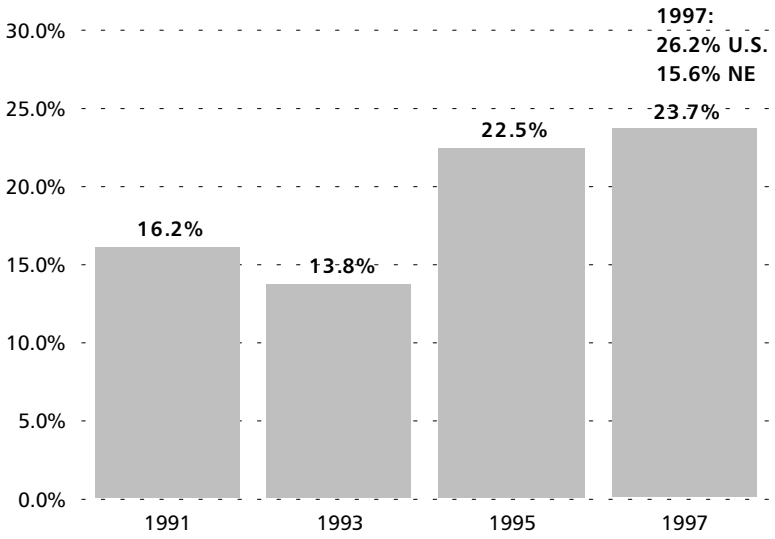

Figure 1: Marijuana use in Lancaster County. Percent of students using marijuana in the past 30 days.[1]

alcohol and 42.1% binge drinking. Alcohol use and binge drinking have remained fairly stable over the past ten years among Lancaster County students.

Binge drinking is more prevalent among young adults (18–25) in Lancaster County than in the nation. The national rate of binge drinking for this population is 32.0%, and 26.3% of young adults reported binge drinking in the month prior to the 1999 Behavior Risk Factor Survey (BRFS) in Lancaster County.

An estimated 2.5 million Americans used marijuana for the first time in 1996. Marijuana use has been increasing since 1991 in the United States. The increased rates of use during the 1990s seem to reflect primarily from the increasing rate of new use among youth.

An estimated 11.1 million Americans reported using marijuana during the past month in 1997. This is approximately 5.1% of the population age 12 and older. Marijuana is the most commonly used illicit drug. The 1997 survey data found that among current illicit drug users, 80% were marijuana users.[10]

Marijuana use among adolescents is a concern in Lancaster County because of an increase over the past ten years among high school students reporting use in the month prior to the survey. In 1997, according to the YRBS, 23.7% of students surveyed reported recent marijuana use compared with 16.2% in 1991 (see fig. 1). This rate is higher than the 15.6% self-reported rate of marijuana use by Nebraska students the month prior to the 1997 survey but slightly lower than the 26.2% reported by students in the nation.

Law enforcement intelligence data and treatment admissions indicate a rise in youth and adult methamphetamine use. Methamphetamine use is a growing state problem. This is demonstrated by the increase in meth lab seizures during the past two years. In 1997 two meth labs were seized, while in 1998 thirteen were seized. Meth is cheap and easy to make; therefore, the drug manufacturers and dealers are able to make the drug extremely appealing to youth.[12]

In 1997, Lancaster County high school students reported higher rates of inhalant use one or more times during their lifetime than did students nationally but lower rates than students in Nebraska. Inhalant use (including sniffing glue, breathing the contents of aerosol spray cans, or inhaling any paints or sprays to get high) was reported by 17.9% of Lancaster County students, with the greatest percentage being reported by younger students. Nationally, 16.0% of students reported inhalant use compared with 19.9% of Nebraska students.

YRBS data have consistently indicated that substance abuse is more likely to be reported by males than by females, except for inhalant use. Table 2 shows a comparison of the YRBS results by sex for 1997.

Table 2: Alcohol and other drug use in Lancaster County, male and female comparison, 1997.[1]

	Males	Females
Alcohol use	51.0%	45.9%
Binge drinking	35.2%	28.5%
Marijuana use	26.1%	21.6%
Inhalant use	16.3%	19.3%
"Other" illegal drug use	21.2%	17.1%

Health Disparities

Minority and ethnic members of the Lancaster County community are faced with challenges regarding alcohol and substance abuse. Typically, members of these communities report higher rates of use and resulting negative health consequences. This population is also more commonly exposed to the influences surrounding substance use than are groups in other areas of Lancaster County.

Nationally, the highest rates of alcohol-related motor vehicle fatalities per 100,000 population were found among Native-Americans (28.0%) and Asians (19.6%), while African-Americans and Whites reported the lowest rates at 6.2 per 100,000 population.[2]

According to the YRBS, during the past ten years nonwhite or Hispanic students have consistently reported greater rates of use for marijuana and "other illegal drugs" than have their white counterparts. Reported marijuana use has increased at similar rates between nonwhite or Hispanic students and white students. In 1997, nonwhite or Hispanic students reported 48.4% had used marijuana in the past month while 37.2% of white students reported use. Reported "other illegal drug" use has remained fairly stable among the two populations during the past ten years, but the nonwhite or Hispanic rate remains higher than the white rate. In 1997, 18.4% of white students reported using one or more of the "other illegal drugs" at least once during their lifetime, while 25.8% of nonwhite or Hispanic students reported use.

Differences in reported rates for white and nonwhite or Hispanic students according to the 1997 YRBS results are shown in Table 3.

The 1994 Minority Behavior Risk Factor Survey (MBRFS) and the 1995 BRFS show a significant difference in young adult (aged 18–25) reported binge drinking in the month prior to the surveys. The white rate reported from the BRFS was 34.3%, while the nonwhite or Hispanic rate reported from the MBRFS was 71.2%.

Many of the poorer and less economically developed neighborhoods in Lancaster County have higher percentages of ethnic and minority populations than other areas of the county. Higher concentrations of alcohol outlets are typically found in these poorer neighborhoods. Alcohol is thus more accessible and more aggressively promoted to these populations.[8] Areas where alcohol outlets are more concentrated also reflect more alcohol-related problems. Evidence shows that areas with greater outlet densities have greater alcohol related crashes, assaultive violence, youth violence, and alcohol-related pedestrian injuries.[14] The community needs to evaluate the concentration and distribution of alcohol outlets in these neighborhoods and then examine zoning laws and economic development within the poorer areas.[8]

Table 3: Alcohol and other drug use in Lancaster County, White/Nonwhite or Hispanic comparison, 1997.[1]

	White	Nonwhite or Hispanic
Alcohol use	47.5%	53.2%
Binge drinking	31.4%	32.3%
Marijuana use	37.2%	48.4%
Inhalant use	24.2%	17.2%
"Other" illegal drug use	18.4%	25.8%

Public Health Infrastructure

Behavior trends are generational and reflect strong community norms. To effectively change the trends in alcohol and drug use or related behaviors, the community norms need to be changed. To establish what are the community norms, we must first discover the norms, and the most beneficial way to do this is to simply ask the public. By determining the perceptions of our community and correcting any misperceptions based on facts, we will be able to uncover the underlying force of the community norms and begin changing the norms.

Adult drinking and driving is hard to assess based on the current question in the Behavioral Risk Factor Survey. It has been proposed to include a question on a community survey that replicates the question in the Youth Risk Behavior Survey: "During the past 30 days, how many times did you drive a car or other vehicle when you had been drinking alcohol?"

It has also been proposed to use the community survey to ask about adult marijuana and methamphetamine use. It would be preferable if these questions also replicated the questions asked in the Youth Risk Behavior Survey: "During the past 30 days, how many times did you use marijuana?" and "During your lifetime how many times have you used methamphetamines (also called speed, crack, crank, or ice)?"

Recommendations

- Implement a more collaborative community effort to address broad alcohol and drug-related issues and provide multisystemic prevention and treatment initiatives.
- Develop new proactive programs and continue to provide assessments, interventions, treatment, and referrals for Lancaster County citizens including children, youth, parents, and racial and ethnic minorities.
- Emphasize strength-based support systems, including family support, to reduce high-risk behaviors based on genetics, family history, and environment.
- Assess community norms relating to underage drinking and perceptions of dangerous behavior through a community survey. Develop strategies to pull together community networks to change this community norm, if necessary.
- Determine a method to track adult methamphetamine use to create baseline data for future indicators.

Notes

Table 1

-- Currently no data source.

1. Nebraska Office of Highway Safety, 1996–1998.
2. Nebraska Office of Highway Safety, 1996.
3. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. Fatality Analysis Reporting System, Department of Transportation, 1996.
4. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
5. Nebraska Office of Highway Safety, 1998.
6. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. General Estimates System, Department of Transportation, 1996.

Related discussion or indicators are located in the chapters on *Maternal and Child Health* and *Sexual Behavior*.

7. Lincoln–Lancaster County Health Department, Youth Risk Behavior Survey, 1997.
8. The Buffalo Beach Company, The 1997 Youth Risk Behavior Survey: Summary Tables of Nebraska Data, 1997.
9. Centers for Disease Control and Prevention, Youth Risk Behavior Survey, 1997.
10. Lincoln–Lancaster County Health Department, Behavioral Risk Factor Survey, 1999.
11. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. National Household Survey on Drug Abuse (NHSDA), SAMHSA, 1996.
12. Currently no data source. Could be obtained through a combination of currently obtainable Youth Risk Behavior Survey data and the development of a community survey tool.
13. Currently no data source. Could be obtained through a community survey tool.
14. Currently no data source. Data will be available from the 1999 Youth Risk Behavior Survey.

Table 2–3 and Figure 1

1. Lincoln–Lancaster County Health Department, *Youth Risk Behavior Survey*, 1997.

Narrative sources

1. Nebraska Department of Health. *Nebraska Year 2000 Health Goals and Objectives: A MidCourse Review*. Nebraska Department of Health, 1996.
2. U.S. Department of Health and Human Services. *Healthy People 2010 Objectives: Draft for Public Comment*. U.S. Department of Health and Human Services, 1998.
3. P.W. Meilman, "Alcohol-induced Sexual Behavior on Campus." *Journal of American College Health* 42, 1993, pp. 27–31.
4. Wilks, J., and Callan, V.J. "Expectation about Appropriate Drinking Contexts: Comparisons of Parents, Adolescents and Best Friends." *British Journal of Addiction* 83, 1988, pp. 1055–1062.
5. Wagenaar, A.C., et al. "Where and How Adolescents Obtain Alcoholic Beverages." *Public Health Reports* 108, 1993, 459–464.
6. Shaw, R.A., et al. "Effects of Adolescent ATOD Behaviors and Attitudes of a 5-Year Community Partnership." *Evaluation and Program Planning* 20, 1997, pp. 307–313.
7. Wechsler, H. "Alcohol and the American College Campus: A Report from the Harvard School of Public Health." *Change* 28, 1996, pp. 20–25, 60.
8. Toomey, T.L., and Wagenaar, A.C. "Policy Options for Prevention: The Case of Alcohol." *Journal of Public Health* 20, 1996, pp. 192–213.
9. National Highway Traffic Safety Administration, *1997 Traffic Safety Alcohol Facts*, 1997.
10. *National Household Survey on Drug Abuse*, The Substance Abuse and Mental Health Services Administration, 1997 <http://www.health.org/pubs/97hhs/nhsda979.htm> 9 August 1999.
11. National Inhalant Prevention Coalition. *National Inhalant Prevention Coalition Web Site*. 1997. <http://inhalants.org> 17 August 1999.
12. Turk, Gregory. "Nebraska on Verge of Meth Boom?" *Lincoln Journal Star* 16 August 1999, sec. C: 1+.
13. *Anti-Meth Web Site*, Methamphetamine Control Strategy of Arizona, 1999 <http://antimeth.com> 17 August 1999.
14. *Costs of Underage Drinking*, The National Clearinghouse for Alcohol and Drug Information, 1998 <http://www.health.org/costs/text.htm> 2 September 1999.

Sexual Behavior

Health Objectives for the Year 2010: Build a community in which healthy sexual relationships, free of infection as well as coercion and unintended pregnancy, are the norm.

Health Implications

Sexual Behavior

High-risk sexual behavior can have many consequences, some of which include unintended pregnancy and sexually transmitted diseases. Factors influencing high-risk sexual behavior include lack of knowledge, early participation in sexual intercourse, misuse of alcohol and other illicit drugs, poor communication between parents and children and between sex partners, and unbalanced messages from the mass media. Establishing a new social norm of healthy sexual behavior should be the basis for long-term prevention of the consequences of high-risk sexual behavior.

Teen Pregnancy

The problems associated with unintended pregnancy are multiple, and the consequences are well documented: reduced educational attainment, fewer employment opportunities, increased likelihood of welfare dependency, and poorer health and developmental outcomes. Teenage mothers are less likely to get or stay married, less likely to complete high school or college, and more likely to require public assistance and to live in poverty than their nonpregnant counterparts. Infants born to teenage mothers, especially mothers under age 15, are more likely to suffer from low birth weight, neonatal mortality, and sudden infant death syndrome. They may also be at greater risk of child abuse, neglect, and behavioral and educational problems.

Giving birth to a second child while still a teen further increases these risks. The prevention of second and higher order births to very young women is of great interest to public health. Research has shown that such births are associated with physical and mental health problems for the mother and the child. For teen mothers on welfare, a subsequent birth during adolescence reduces the likelihood of getting off public assistance. Nationally, data indicate that in the two years following the first birth, teen mothers have a second birth at about the same rate as other mothers. In 1995, nearly one in every five births to teen mothers was a birth of second order or higher.

Sexually Transmitted Diseases

Among the top ten most frequently reported diseases in 1995 in the United States, five are sexually transmitted diseases (STDs). Despite the burden, costs, and preventable nature of STDs and their complications, STDs remain a

Table 1. Sexual Behavior Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010
Percent of adolescents abstaining from sexual intercourse	63.2[1]	75.0	53.3[2]	--	51.6[3]	75.0[4]
Adolescent births (15–17 years of age) per 1,000 population	25.2[5]	19.0	20.5[6]	--	30.4[7]	--
Percent of second pregnancies among unwed adolescents (<20 years of age)	21.8[5]	15.0	17.2[8]	--	--	--
Incidence of AIDS per 100,000 population	3.3[9]	3.0	3.6[10]	--	27.8[11]	--
Incidence of gonorrhea (15–24 years of age) per 100,000 population	340.6[9]	280.0	325.2[12]	--	555.6[13]	--
Incidence of herpes simplex-2 per 100,000 population	99.8[9]	60.0	60.3[14]	--	--	--
Incidence of chlamydia (15–24 years of age) per 100,000 population	889.3[9]	650.0	912.7[12]	--	974.3[13]	--

largely ignored health problem by the American public, policymakers, and public health and health care professionals. STDs are "hidden epidemics" of tremendous health and economic consequence in the United States. They are hidden from public view because many Americans are reluctant to address sexual health issues in an open way and because of the biological and social factors associated with these diseases. STDs represent a growing threat to the nation's health.

The better-known STDs that may cause mild initial illnesses are only part of a very large public health problem. These organisms also cause many other harmful, often irreversible, and costly clinical complications, such as reproductive health problems, fetal and perinatal health problems, and cancer. STDs are common, costly, and preventable.

Each year an estimated 15 million Americans are infected with a STD, including 3 million teenagers. Conservatively, the direct and indirect costs of the principal STDs and their complications, including sexually transmitted HIV infection, are estimated at $17 billion annually.

Current Status and Trends

Teen Pregnancy

Nationally, progress toward reducing adolescent pregnancy from a baseline of 71.1 per 1,000 (in 15-year-old to 17-year-old females) to a level of 50 per 1,000 remains distant. In 1992, there were 72.9 pregnancies per 1,000. In Lancaster County, the teen pregnancy rate among females aged 15–19 years increased from 29 per 1000 population in 1990 to 33 per 1000 population in 1997.

In 1992 the Lincoln–Lancaster County Health Department implemented a High Risk Prenatal Program in which pregnant teens aged 15–19 are enrolled for Public Health nursing visits. Only 7% of these at-risk teens have been enrolled for a subsequent pregnancy. In the general population of Lancaster County, the percentage of mothers 15–19 years of age who had one previous birth is much higher at 15.9%.

Progress toward postponement of adolescent sexual intercourse between 1990 and 1995 was mixed. Although fewer 15-year-old males and females and fewer 17-year-old males had engaged in sexual intercourse, the proportion of 17-year-old females who had sexual intercourse increased slightly. For adolescents overall, data from the National Survey of Family Growth (NSFG) indicate that the proportion of females aged 15–19 who have ever had sexual intercourse dropped from 55% in 1990 to 50% in 1995.

The proportions of both adolescent males and females reporting sexual intercourse during the previous three months have declined at the national level. In 1997, 47.2% of surveyed Lancaster County 11th and 12th graders reported abstaining from sexual intercourse, which is an increase from 40.5% in 1991.

Contraceptive use by sexually active adolescents is increasing. The proportion of sexually active unmarried females aged 15–19 who used contraception at first intercourse rose from the 1988 baseline of 63% to 77% in 1995. Dual use of oral contraceptives and condoms during recent intercourse by females rose from the very low level of 2% in 1988 to 8% in 1995. In Lancaster County 56% of sexually active adolescents, 15–19 years of age, reported using condoms. This reflects no change from the 55.7% reporting condom use in 1991.

Sexually Transmitted Diseases

Significant progress has been made toward reducing the burden of the common bacterial STDs in the United States, such as gonorrhea, syphilis, and congenital syphilis – diseases for which national control programs have existed for the longest period. Encouraging data are emerging from a new and expanding chlamydia prevention program, suggesting that chlamydia screening is reducing disease burden and preventing complications. Nevertheless, STD complications continue to take a heavy toll on women's health and health care costs.

Viral STDs continue to present challenges for prevention and control. Women now account for 20% of all AIDS cases in the United States, with young minority women (who also incur a disproportionate share of other STDs) incurring a disproportionate share of heterosexually transmitted HIV infection. Results of a recent nationally representative study show that genital herpes infection is extremely common in the United States. Nationwide, 45 million people aged 12 and older, or one out of five of the total adolescent and adult population, are infected with HSV-2.

In 1997, chlamydia was the most frequently reported communicable disease in the United States, with 527,268 cases reported. An estimated 4 million new chlamydia infections occur in the United States every year; 2.6 million are in women. Chlamydia is extremely common in sexually active adolescents and young adults. The highest annual rates are reported among females aged 15–19. The incidence of chlamydia in Lancaster County for 1997 was 197.6 per 100,000 population. This is an increase from 167.6 per 100,000 population in 1990.

Since 1990 the U.S. gonorrhea rate has decreased by 56% (from 278.0 per 100,000 in 1990 to 122.7 in 1997). The 1997 rate is the lowest rate ever reported in the United States. The incidence of gonorrhea in Lancaster County for 1997 was 67.7 per 100,000 population. This is a decrease from 77.7 per 100,000 population in 1990.

Among women, 15-year-olds to 19-year-olds had the highest rate 19%, while among men, 20-year-olds to 24-year-olds had the highest rate 22%. Between 1990 and 1996, the gonorrhea rate among adolescents decreased by 49% (from 1,114.4 per 100,000 in 1990 to 570.8 in 1996). In 1997, 64% of all gonorrhea cases reported in Lancaster County were among persons aged 15–25.

Among men who have sex with men, gonorrhea trends may reflect changes in sexual behaviors that also influence risk for HIV infection. Data from the Gonococcal Isolate Surveillance Project (GISP) indicate that the number and proportion of men who have sex with men diagnosed with gonorrhea has increased in the STD clinics of several large cities located in the western United States.

Health Disparities

The percentage of teen births that are White has gradually declined in recent years (1987–95), while the percentages of Asian, Hispanic, and Black teen births have gradually increased.

Some STD rates are disproportionate in some minority communities. For example, AIDS cases in the African-American and Hispanic communities are at higher rates than their percentage of the population. In Nebraska, 26% of AIDS cases reported were among persons of color; in Lancaster County, 17% of AIDS cases were. The percent of

HIV infections reported in Nebraska among persons of color is 35% and in Lancaster County 24%.

Since 1990, gonorrhea rates have decreased for all racial and ethnic groups, and the large African American–White ratio has begun to decline. Over this period the African American to White ratio in reported gonorrhea rates has declined from 36:1 to 31:1. In 1997 gonorrhea rates for all racial and ethnic groups was below the Healthy People 2000 national target of 100 per 100,000 population except for African Americans. Among African Americans, the reported rate was 812. In Lancaster County, 24% of all reported gonorrhea cases in 1998 were among African Americans, which is a decrease from 42% in 1996. Hispanics accounted for 5% of all reported Lancaster County gonorrhea cases in 1998, an increase from 4% in 1996.

Large race/ethnicity disparities still exist, especially among young people. In 1997, more than 3% (greater than 3000 per 100,000 population) of young African Americans (15–24) had gonorrhea. This compares to 130 per 100,000 for whites 15 to 19 years old and 104 per 100,000 for whites 20 to 24 years old. In 1998, young African Americans (aged 15–24) accounted for 19% of all reported gonorrhea cases in Lancaster County, while young Whites accounted for 29% of reported gonorrhea cases.

Public Health Infrastructure

As Lancaster County's population continues to become more and more diverse, it will be critical that programs addressing sexual behavior and STDs be culturally competent and multilingual. In addition, services must be easily accessible by people of all racial, cultural, and ethnic backgrounds.

To ensure timely reporting of sexually transmitted diseases, current reporting methods need to be updated to take advantage of current and emerging technologies. Timely reporting can reduce further morbidity by early detection and treatment of new cases of STD.

Recommendations

- Commit to funding a wide range of programs that are inclusive of all adolescents and that address sexual behavior and the consequences of such behavior.
- Make readily available and easily accessible services for the diagnosis, treatment, and followup of sexually transmitted diseases. The services should be culturally sensitive and minimize barriers to those at significantly high risk.
- Design and implement programs that will reduce the number of second pregnancies among at-risk adolescents in the community.

Notes

Related discussion or indicators are located in the chapters on *Maternal and Child Health*, *Healthy Children*, and *Immunization and Communicable Disease*.

Table 1

-- Currently no data source.

1. Lincoln–Lancaster County Health Department, Youth Risk Behavior Survey, 1997. Percentage responding that they have never had sexual intercourse.
2. The Buffalo Beach Company, *The 1997 Youth Risk Behavior Survey: Summary Tables of Nebraska Data*, 1997.
3. Centers for Disease Control and Prevention, *Youth Risk Behavior Surveillance – United States, 1997*, MMWR, volume 47 (SS-3), pp. 1–89.
4. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. National objective is to reduce to 25% the percentage of those 15 to 17 who have ever had sexual intercourse.
5. Lincoln–Lancaster County Health Department, Vital Statistics, 1998.
6. Nebraska Health and Human Services System, *Nebraska Vital Statistics Report*, 1998.
7. Centers for Disease Control and Prevention, *National Vital Statistics Reports*, vol. 47, no. 25. Births and Deaths: Preliminary Data for 1998.
8. Nebraska Health and Human Services System, 1998 data from the Nebraska Vital Statistics, provided by department staff.
9. Lincoln–Lancaster County Health Department, *Morbidity and Mortality Report*, 1998.
10. Nebraska Health and Human Services System, *Nebraska HIV/AIDS/STD Prevention Community Planning: Epidemiological Profile*, 1999.
11. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1996 data from the HIV/AIDS Surveillance System.
12. Nebraska Health and Human Services System, Public Health Assurance, Communicable Diseases Section, Sexually Transmitted Disease Program. 1998 data provided by program staff.
13. U.S. Department of Health and Human Services, Office of Public Health and Sciences, *Sexually Transmitted Diseases Surveillance*, 1998.
14. Nebraska Health and Human Services System, *Sexually Transmitted Diseases*, 1994–98.

Narrative sources

U.S. Department of Health and Human Services Office of Public Health Science, *Healthy People 2010 Objectives: Draft for Public Comment*, 15 September 1998, Chapter 12: Maternal, Infant, and Child Health.

U.S. Department of Health and Human Services Office of Public Health Science, *Healthy People 2010 Objectives: Draft for Public Comment*, 15 September 1998, Chapter 25: Sexually Transmitted Diseases.

Lincoln–Lancaster County Health Department, "The Health of Infants Born to Teen Mothers," *Epi Info*, February 1997.

Immunization and Communicable Disease

Health Objective for the Year 2010: Prevent disease, disability, and death from infectious diseases, including vaccine-preventable diseases.

Health Implications

Immunizations

Few measures in public health can compare with the benefits of vaccines. For each dollar spent on the measles, mumps, and rubella vaccine (MMR), $13.50 is saved. Polio vaccine yields $6.10 in savings for every dollar spent.[1] These same kinds of savings accrue for each vaccine that is part of the recommended immunizations for both children and adults. These cost savings include prevention of work loss by parents to take care of ill children, and prevention of lost earnings from disability and prevention of death. All the vaccines routinely recommended for children are highly cost saving. On average, more than 2,000 immunizations are given each month through the Lincoln–Lancaster County Health Department's immunization program, and the cost saving each month would amount to over $13,000.

The ravaging effects of preventable disease, primarily among our youth, have taught us that vaccines can play a powerful role in preventing the debilitating and, in some cases, fatal effects of infectious diseases. During one year in the 1960s, more than 20,000 infants were born with major malformations, including deafness, blindness, congenital heart disease, and mental retardation, because their mothers were infected with rubella virus during pregnancy. The organisms have not disappeared. They have receded into the background, due to the remarkable effect that vaccines have had in preventing them, but they will reemerge if vaccination coverage levels drop. The serious health burden of vaccine-preventable diseases (VPDs) is evident from the measles resurgence of 1989 to 1991, which resulted in at least 55,000 cases, over 11,000 hospitalizations, and more than 120 deaths. More than $100 million was spent on direct medical care costs.

Approximately 45,000 adults die each year from complications associated with pneumococcal disease and influenza. With the aging of our population, increasing numbers of adults will be at risk for these major causes of death and illness. Persons with high-risk conditions (e.g., heart disease, diabetes, chronic respiratory disease, and asthma) remain at increased risk, as do persons living in institutional settings. Vaccination is an effective strategy to reduce illness and deaths due to pneumococcal disease and influenza.

Vaccines protect more than the vaccinated individual; they protect society as well. When immunization

Table 1. Immunization and Communicable Disease Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Percent immunization coverage among children 19–35 months of age (public health clinics)	74.0[2]	90.0	72.0[2]	--	76.0[3]	90.0
Incidence of hepatitis C per 100,000 population	1.3[4]	1.0	0.3[5]	--	3.7[6]	1.0
Incidence of tuberculosis per 100,000 population	2.1[4]	1.0	1.9[5]	--	8.0[7]	1.0
Incidence of HIV-1 per 100,000 population	7.3[4]	5.0	4.6[5]	--	--	--
Incidence of hepatitis B per 100,000 population	2.1[4]	1.0	1.4[5]	--	22.9[6]	--
Percent of children enrolled in a fully functional population-based immunization registry (birth through age 5)	0[8]	50.0	--	--	--	--
Percent immunization coverage for children in licensed day care facilities	55.0[9]	95.0	55.0[9]	--	95.0[10]	95.0
Percent of adults 65 years of age and older reporting getting flu immunization	73.2[11]	90.0	64.0[12]	--	65.9[13]	90.0

levels in a community are high, the few who cannot be vaccinated, such as those too young for vaccination and those who have legitimate contraindications to immunization, are often indirectly protected because they are surrounded by vaccinated persons and do not get exposed to disease (herd immunity).

Communicable Diseases

Illness, disability, lost productivity, and death associated with infectious diseases can have a significant impact on individuals, families, and the community. Reporting of infectious disease is fundamental to preventing further spread of disease, determining common source outbreaks, identifying emerging disease, assuring appropriate medical therapy, and planning and evaluating disease prevention and control programs. Such information is basic for determining short-term and long-term trends and for establishing the magnitude of disease in the community. In an era of tight cost containment, accurate and consistent disease reporting is essential to facilitate the establishment of meaningful program priorities.

The ability to rapidly respond to a disease outbreak is the most important aspect of a good surveillance and reporting system. Without the ability to respond quickly and effectively, the capacity to limit disease spread within the community is compromised. The implementation of current technology into communicable disease programs will help facilitate the ability of local health departments to identify and respond quickly to disease outbreaks.

Current Status and Trends

Immunizations

In general, significant progress has been made in reducing indigenous cases of vaccine-preventable diseases (VPDs). Nationally, according to provisional 1997 data, zero cases of wild-virus polio, four cases of congenital rubella syndrome, five cases of diphtheria among people 25 years old and younger, and five cases of tetanus among people less than 25 years old were reported. Measles was reduced from a 1988 baseline of 3,058 cases to only 135, and rubella was reduced from 225 to 161. These VPDs have a Healthy People 2000 goal of zero cases. Mumps, with a Healthy People 2000 goal of 500 cases, was reduced from 4,866 to 612. Pertussis (whooping cough), with a Healthy People 2000 goal of 1,000 cases, has increased from 3,450 in 1988 to 6,568 cases in 1997.

Substantial progress has been made in implementing a strategy to eliminate hepatitis B virus (HBV) transmission in the United States. From 1991 (when routine infant hepatitis B vaccination was first recommended) to 1996, the proportion of 19-month-old to 35-month-old children who have received three doses of hepatitis B vaccine has increased from less than 10% to 82%. Implementation of programs for catch-up vaccination of all adolescents has also recently begun, and state law now requires adolescents to be vaccinated in order to enter school.

Achieving the Year 2000 Objective related to reduction in the incidence of bacterial meningitis was entirely due to introduction of Hib vaccine for infants. The vaccine was first licensed in 1990 for use in infants beginning at age two months. The Hib vaccine is highly effective in protecting individuals against Hib meningitis (the most common form of bacterial meningitis in children). In 1989, eight cases of Hib meningitis were reported in Lancaster County. Between 1990 and 1995, only one case was reported each year. The last case of Hib meningtitis in Lancaster County was reported in 1995.

Immunization coverage levels for children aged 19 to 35 months rose in 1998 to 74%. Recently immunization requirements for schools and daycare settings were expanded to include recently developed vaccines. In 1998 Lancaster County had 82% of its children at one year of age and 55% of its children at two years of age adequately immunized.

The financing of childhood immunizations has been significantly improved as a result of two major initiatives. The Vaccines for Children Program and the Child Health Insurance Program cover children on Medicaid, uninsured children, and American Indian and Alaska Native children. In addition, underinsured children who receive immunizations at federally qualified health centers and rural health clinics are covered. Because free vaccines are provided to needy children, the vaccine cost is not a barrier to receipt of immunizations. Also, the 317 Grant Program and state funds help provide free vaccines for children not covered by the other programs.

Immunization coverage levels among adults vary widely by risk group. Influenza and pneumococcal vaccines are covered by Medicare, thus supporting the feasibility of vaccinating greater numbers of older adults.

Communicable Diseases

A few decades ago experts predicted that the public health significance of infectious diseases would continue to decline in the United States, yet they remain a major source for morbidity and mortality in this country. In addition, we continue to detect new infectious agents and diseases, and diseases considered to be under control have reemerged in recent years. Compounding the problem of emerging infections, antimicrobial resistance is evolving rapidly in a variety of hospital- and community-acquired infections. These trends provide reminders of the importance and potential volatility of infectious diseases at the turn of the century.

The global context of infectious diseases must also be considered. Increases in international travel, importation of foods, improper human and veterinary use of antibiotics in the United States and abroad, and global environmental changes increase the potential for global epidemics of infectious diseases, including emerging and reemerging diseases as well as drug-resistant strains.

Because of their impact on society, infectious diseases require a coordinated strategy to understand, detect, control, and ultimately prevent them. This strategy covers four goal areas: surveillance and response, applied research, infrastructure and training, and prevention and control.

In Lancaster County, local outbreaks of Giardiasis, Shigellosis, E. coli O157:H7, and Pertussis are just some of the reminders that communicable diseases continue to impact our community. In strengthening the areas of surveillance and response, applied research, infrastructure and training, and prevention and control, we are assuring that our community remains capable of effectively preventing and, when necessary, quickly responding to communicable disease outbreaks.

Surveillance, the cornerstone of communicable disease control, is greatly dependent on the cooperation of many in the community. The community's health care providers, laboratories, hospitals, infection-control practitioners, and other professionals report communicable diseases in a timely manner because they understand not only the legal requirement but more important the public health impact. Lancaster County must continue to develop our local reporting system by taking advantage of current and future technologies that will increase the timeliness of reporting to the community's surveillance system.

Our community's population is ever changing, and the health needs of sections of our population present

special needs in the area of communicable diseases. Populations migrating from areas where diseases such as tuberculosis are common have increased the need for communicable disease program services. As immigration into the area continues to increase, the availability of initial health services to assess health status, including administering immunizations and TB testing is increasing in importance as a community need. Although the incidence of tuberculosis is low in Nebraska and Lancaster County, the need for preventive therapy, including "direct observation therapy," has increased.

Health Disparities

Although childhood immunization rates have been historically lower in minority populations, there has been a significant narrowing of the gap. The October 1997 issue of the *Morbidity and Mortality Weekly Report* documents the findings from the National Immunization Survey, and it shows substantial progress toward achieving 1996 Childhood Immunization Initiative coverage goals by racial and ethnic group. Despite this unprecedented progress, efforts to increase vaccination coverage need to be intensified, particularly for children living in poverty.

Rates for some infectious diseases are disproportionate in some minority communities. For example, HIV-1 cases in the African-American and Hispanic communities are at higher rates than their percentage of the population. Tuberculosis is another example of a disease that has higher rates in refugee populations from areas with high endemicity for TB.

Public Health Infrastructure

A fully functional vaccination registry includes the capability to automatically enroll all children at birth, give providers access to complete immunization history, recommend needed immunizations, recall children who are overdue for immunizations, and assess coverage at the practice and geographic level. Optimally, such registries should contain additional important functions, such as automation of the submission of adverse-event reports.

State and community immunization registries will be the cornerstone of our nation's immunization system by 2010. Registries facilitate the timely immunization of children by ensuring that the child's complete vaccination history is available to the health care provider before an office visit. The information that registries contain along with database management capabilities also facilitates several proven methods for increasing immunization coverage: reminder/recall systems and feedback of practice-based coverage levels to immunization providers for example. Registries also provide a simple means for assessment of immunization coverage at the geographic level and population level, thus facilitating efforts to reduce gaps in coverage among subgroups of persons.

Few immunization registries existed before 1992, and little data are available regarding the extent to which they have been implemented. However, a 1997 Center for Disease Control survey showed immunization registries were planned in all states, had been started in at least one public clinic in 44 states, and were active at all public clinic sites in 13 states (unpublished data, CDC).

Recommendations

- Maintain and improve immunization levels in Lincoln–Lancaster County by commiting to making immunizations accessible and available to all children. Promote immunization among populations in the community with low immunization rates by taking advantage of current knowledge and resources to reduce barriers to immunization services.
- Shift current surveillance methods from a paper system of reporting to electronic reporting to increase disease follow-up response time and the ability to prevent further disease spread.
- Provide an easily accessible program for making timely initial health assessments and referrals for individuals who immigrate from other countries to the local community.

Notes

Related discussion or indicators are located in the chapters on *Maternal and Child Health*, *Healthy Children*, *Safe Food*, and *Public Health Emergency Management*.

Table 1

-- Currently no data source.

1. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. Nebraska Health and Human Services System, *Immunization Program Report*, 1999.
3. Americas Children; Key National Indicators of Well-Being, 1999, CDC, 6 January, 2000,
4. Lincoln–Lancaster County Health Department, *Morbidity and Mortality Report*, 1998.
5. Nebraska Health and Human Services System, Public Health Assurance, Communicable Diseases Section, Sexually Transmitted Disease Program. 1998 data provided by program staff.
6. U.S. Dept. of Health and Human Services, *Healthy People 2000 Review 1997, National Health Promotion and Disease Prevention Objectives*. 1995 data from the National Notifiable Disease Surveillance System, Sentinel Countries Surveillance of Acute Viral Hepatitis, Viral Hepatitis Surveillance Program.
7. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1996 data from the National TB Surveillance System.
8. There is currently no population-based immunization registry in Lancaster County.
9. Nebraska Health and Human Services System, *Immunization Program Report*, 1999.
10. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1995–1996 data from Annual Survey by State Immunization Programs.
11. Lancaster–Lancaster County Health Department, Behavioral Risk Factor Survey, 1999.
12. Nebraska Health and Human Services System, *Behavioral Risk Factor Surveillance System Report,* 1995–96.
13. Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, Behavioral Risk Factor Surveillance System Online Prevalence Data, 1995–98. 1998 national BRFS data from tabulation query: <http://www2.cdc.gov/nccdphp/brfss/>

Narrative sources

1. National Immunization Program, Center for Disease Control.

Unintentional and Intentional Injury

Health Objectives for the Year 2010: Reduce the incidence and severity of unintentional and intentional injuries.

Health Implications

In 1995, 143,000 Americans died from injuries sustained from causes such as motor vehicle crashes, falls, fire, drownings, poisonings, homicides, and suicides. This number translates into the death by injury of more than 390 people each day, of which at least 50 are children.[1] The cost of injury in 1995 was estimated at $260 billion.[2] One death out of every 14 in the United States results from injury. Approximately two-thirds (65%) of these deaths were classified as unintentional injury (e.g., motor vehicle crashes, Fire and burns, falls) and one-third (35%) as being caused by intentional injury (e.g., homicide, suicide, abuse, assault).[1]

Unintentional injury is the fifth leading cause of death in Lancaster County. It is the number one killer of Lancaster County residents between the ages of 1 and 29 years.[3]

The risk of injury is so great that most people sustain a significant injury at some time during their lives. Nevertheless, this widespread human damage is too often benignly accepted in the erroneous belief that injuries happen by chance and are the result of unpreventable "accidents." These occurrences are not "accidents," or random, uncontrollable acts of fate, however; injuries are predictable and preventable, and preventing them costs much less than treating them.[1]

Violence is pervasive in our society and reduces the quality of life. Americans are shocked by reports of children killing other children in schools, and parents are concerned about the safety of their children at school. Reports of gang violence even in small towns and rural areas make people fearful for their own and their family's safety. An increase in suicides among young people and the elderly raises concerns about the vulnerability of people in these age groups. Intimate-partner violence and sexual assault threaten women in all walks of life. Violence claims the lives of many of our nation's young people and threatens the health and well-being of many Americans. On an average day in the United States, 70 people die from homicide, 87 people commit suicide, as many as 3,000 people attempt suicide, and at least 18,000 people survive assaults.[1]

Domestic violence occurs at all hours, seven days a week, and in all parts of Lincoln and Lancaster County. The number of clients served at both

Table 1. Unintentional and Intentional Injury Indicators

	Lancaster Recent	Lancaster Objective 2010	Nebraska Recent	Nebraska Objective 2010	National Recent	National Objective 2010[1]
Unintentional Injury						
Deaths due to motor vehicle crashes per 100,000 population	11.5[2]	7.0	19.0[2]	--	15.8[3]	11.4
Injuries due to motor vehicle crashes ("A" and "B" crashes) per 100,000 population	660.5[2]	634.2	646.9[2]	--	1323.0[4]	953.0
Injuries (emergency room visits) per 1,000 population	97.5[5]	92.0	--	--	131.0[6]	111.0
Injuries (emergency room visits) due to falls per 1,000 population	25.2[5]	20.1	20.0[7]	--	--	--
Injuries (emergency room visits) due to fire and burns per 1,000 population	3.1[5]	1.4	1.0[7]	--	--	--
Percent of youth who always wear safety belt	34.4[8]	55.0	18.7[9]	--	--	--
Intentional Injury						
Suicides per 100,000 population	12.3[10]	9.0	12.2[11]	--	11.2[12]	9.6
Percent of youth carrying weapons	19.9[9]	15.0	17.0[10]	--	20.4[14]	<15.0
Percent of youth indicating they have been in a physical fight in the past 12 months	37.4[9]	27.1	31.4[10]	--	38.7[14]	<35.0
Investigated cases of child abuse and neglect per 1,000 population	27.2[15]	20.0	18.3[15]	--	--	--

the Rape Spouse Abuse Crisis Center (RSACC) and Friendship Home has increased, but calls to RSACC's 24-hour Crisis Line and requests for shelter have declined from record levels in 1997.[4]

There were only eight days in 1998 when law enforcement officers did not investigate either a domestic assault or protection-order violation in Lancaster County. There were 15 days in which at least 10 cases were investigated.[4]

Poverty, discrimination, a lack of education, and limited employment opportunities are important risk factors for violence and must be addressed as part of any comprehensive solution to the epidemic of violence. Strategies for reducing violence should target youth, before violent beliefs and behavioral patterns can be adopted.[1]

The public health approach to reducing violence is multidisciplinary and enlists many strategies and programs. Our society still has a strong conviction that violence can be prevented. Much has been learned about the impact of violence and the burden it imposes on society. Additionally, there are many potentially effective intervention strategies, such as parent training, mentoring, home visitation, and social-cognitive curricula, for violence prevention.[1]

Five causes of injury (motor vehicle crashes, falls, Fire and burns, suicide, and child abuse and neglect) have been selected for emphasis in this report due to their tremendous public health impact. The entire community is affected by these five causes of injury, either directly or indirectly. The injuries result in heavy personal and societal monetary costs (i.e. medical care, rehabilitation, insurance rates, lost or reduced wages) as well as costs related to human suffering, such as emotional and psychological damage, and in some cases the propagation of negative life-altering behavior (e.g. many abused children grow up to become child abusers or criminals.)[10]

(Please see the Animal Control chapter for information about injuries caused by contact with animals.)

Motor Vehicle Crashes

Motor vehicle crashes (MVC) remain the single largest cause of injury deaths in the United States: in 1997, 41,967 people died as a result of a motor vehicle crash. Of those, 315 occurred in Nebraska, including 21 in Lancaster County.[5] The direct cost of all these fatalities to the nation was $47 billion.

An average of 2.2 million Americans per year suffer a disabling MVC, related injury.[6] Almost half of all spinal cord and traumatic brain injuries are caused by these crashes.[7] Over 13,000 Lancaster County residents were treated in local emergency rooms for injuries resulting from a motor vehicle crash during the 1992–95 four-year period. Motor vehicle crashes were the leading cause of accidental death in Lancaster County in 1994 and the second leading cause of accidental death in 1995.[3] The magnitude of the direct and indirect impact on society of MVC, related death and injury dictate that it remain a priority public health concern.

Falls

Falls are the leading cause of injury in Lancaster County. Falls accounted for 23% of the injuries treated by local hospital emergency rooms from 1992 to 1995. Over 7,000 Lancaster County children under 14 years of age were seen by emergency room doctors for treatment of fall-related injuries during the 1992–95 four-year period.[3] Childhood fall injuries can result in disabilities that have lifelong effects. Nationally, falls are the second leading cause of injury deaths among people aged 65 to 84 and the leading cause for people aged 85 and older. In Lancaster County, falls are the most common cause of injuries and hospital trauma admissions among the elderly. The impact of these

injuries on the quality of life is enormous. Half of all elderly adults hospitalized for hip fracture cannot return home or resume independent living after the injury.[1] This is a tragic conclusion to the lives of individuals who might otherwise be healthy.

Fire and Burns

In 1997, an estimated 83,000 children aged 14 and under were treated in the nation's hospital emergency rooms for burn-related injuries. Fires are the second leading cause of unintentional injury death among children. Losses to society from childhood burn deaths and injuries total approximately $5.5 billion annually.[8] An average of 600 Lancaster County residents each year receive emergency room treatment for burn injuries.[3] Burns have long been recognized as among the most painful and devastating injuries a person can sustain and survive. Burns often require long periods of rehabilitation, multiple skin grafts, and painful physical therapy, leaving victims with lifelong physical and psychological trauma. Older adults are at increased risk of fire-related death because they are more vulnerable to smoke inhalation and burns and less likely to recover.[8]

Suicide

Suicide is the ninth leading cause of death in the United States, and the second leading cause of death among Nebraska males aged 15 to 29.[1,9] It has been estimated that for every suicide resulting in death, eight others are attempted.[10] Although death of any sort has an emotional impact on surviving friends and family members, suicide is unique. Suicide has a social stigma, which leaves survivors to cope not only with the grief and upheaval of losing a loved one but also with the perceptions and biases of friends, neighbors, and society in general. Suicide may put tremendous stress on family members and friends who blame themselves for their loved one's actions and subsequent death.[11]

Child Abuse and Neglect

"Child abuse" is a general term used to encompass the physical abuse, psychological or emotional abuse, sexual abuse or sexual exploitation, or neglect of a child.[11] In the United States, more than 3 million reports of child abuse and neglect were filed with authorities in 1997.[12] Child abuse is not confined to any socioeconomic, ethnic, or religious sector of society. It is a function of poorly controlled adult behavior, which is usually the result of emotional, economic, or family stress.[10]

Child abuse carries high costs for individuals and society. In cases of severe injury or death, the human suffering cannot be calculated. Seriously abused and neglected children can suffer permanent neurological, physical, and developmental damage. The transfer of sexually transmitted diseases is a frequent result of child sexual abuse, and unwanted pregnancies are not uncommon. Even less severely abused children may be cognitively, linguistically, and physically impaired.[10]

Retrospective studies of institutionalized adults reveal a significant number of childhood abuse cases. Among juveniles arrested for delinquent acts, 80–90% report a history of abuse and neglect. Adults who mistreat children and/or spouses frequently were abused children themselves. Long-term problems, such as dropping out of school, abusing alcohol and other drugs, committing suicide, or participating in a multitude of other behaviors that have a negative impact on the community, are also often associated with victims of child abuse.[13]

Current Status and Trends

Motor Vehicle Crashes

According to the Federal Department of Transportation, the societal cost of motor vehicle crashes exceeds $150 billion annually. The motor vehicle death rate per 100,000 people is especially high among 16-year-olds to 24-year-olds and people aged 75 years and older. At all ages, males have higher motor vehicle death rates per 100,000 people compared to females.

Rates of motor vehicle deaths have declined substantially over the past 25 years, even taking the increasing numbers of drivers and miles traveled into account. For example, had the mileage death rate of 1972 prevailed in 1996, the number of deaths would have been almost 110,000 rather than 43,399. Over the past three decades, dramatic progress has been made in reducing motor vehicle injuries by (1) understanding the factors that increase the risk of injury; (2) designing interventions to reduce these risks; (3) implementing and then evaluating a wide array of interventions assessing their benefits and costs; and (4) providing this scientific foundation to inform individual and business choices and public policy judgments.[2]

On January 1, 1993, Nebraska joined the growing number of states legislating mandatory safety belt use. Forty-nine states have safety belt laws. The enactment of Nebraska's law, increased enforcement, and enhanced and expanded public education efforts have resulted in a greater than 50% increase (33% in 1992, 67.9% in 1999) in safety belt use statewide. During the same period, Lancaster County safety belt use increased from 38% to 66.9%. Although this is encouraging, there is room for improvement. Young people continue to be inconsistent users of safety belts. According to the 1999 Lincoln–Lancaster County Youth Risk Behavior Survey, only 34.4% of Lancaster County youth always wear a safety belt when riding in a car being driven by someone else. In 1996, 95.1% of Lancaster County parent participants of the Behavioral Risk Factor Survey who had children aged ten and under reported that their children "always" or "nearly always" wore a safety belt or rode in a child safety seat. However, local voluntary community-wide child safety seat checks conducted in 1997 and 1998 found that over 90% of the seats inspected were improperly installed and/or used.

Trauma Registry data for 1997 provided by BryanLGH Medical Center West reveals the economic impact of restraint use. The total hospital cost for restrained patients was $1,799,309 compared to $2,705,276 for unrestrained patients. The average cost per restrained patient was $19,586 compared to $29,088 for the unrestrained patient. Increased community-based educational efforts, such as safety seat inspection activities, in conjunction with stronger child passenger safety laws and continued technological advances will further decrease the risk of death and injury to motor vehicle occupants.

Driver- and passenger-side Supplemental Restraint Systems (SRS), or air bags, became standard safety equipment in all vehicles manufactured in the United States beginning with the 1998 model year. Air bags have demonstrated their effectiveness by preventing and reducing the severity of occupant injuries. Continued advances in air bag technology will provide even greater protection for all vehicle occupants.

Alcohol continues to be a leading factor in MVC-related and mortality. (Please see the Alcohol and Other Drugs chapter for more information.)

Leading Causes of Injuries[1]	Injuries
1. Falls	11,006
2. Motor Vehicle Accidents	5,812
3. Overexertion	4,466
4. Dangerous Tools, Appliances, Machinery	4,108
5. Group Sports	2,641

Leading Number of Days of Hospital Stay[2]	Days
1. Falls	5640
2. Poisonings & Drug Reactions	3494
3. Medical Complications & Misadventures	1538
4. Motor Vehicle Accidents (traffic & nontraffic)	564
5. Suicide & Self Inflicted Injury	437

Leading Causes of Injury Deaths[3]	Deaths
1. Suicide	51
2. Motor Vehicle Accidents (traffic & nontraffic)	37
3. Falls	36
4. Submersion, Suffocation, & Foreign Bodies	11
5. Other Accidents	10

Tables 2–4: Leading causes of injuries, length of hospital stays, cause of injury deaths; Lancaster County.

Falls

In 1995, falls resulted in the deaths of 11,275 people nationwide; among those 7,900 were over the age of 65. Mortality from falls declined by 11% from 1985 to 1995., but among the elderly, the rate increased slightly. Factors that contribute to falls include dementia, visual impairment, neurologic and musculoskeletal disabilities, psychoactive medications, and difficulties with gait and balance. Environmental hazards such as slippery surfaces, uneven floors, poor lighting, loose rugs, unstable furniture, and objects on floors also may play a role.[1]

Falls are the leading cause of nonfatal injury visits to emergency rooms, accounting for approximately 8 million visits yearly.[2] The death rate from falls among children aged 14 and under declined by 36% from 1987 to 1996. However, falls remain the leading cause of unintentional injury for children. Head injuries are associated with the majority of deaths and severe injuries resulting from falls. More than 80% of fall-related injuries among children ages four and under occur in the home. Among older children, ages 5 to 14, 65% of fall-related injuries occur in the home and 23% occur at school. Each year an estimated 211,000 children are treated in hospital emergency rooms for playground-related injuries.[8]

Falls resulted in 21,360 injuries in Lancaster County between 1992 and 1995. The three most common identifiable causes of falls in Lancaster County were (1) tripping, slipping or stumbling; (2) falling from playground equipment; and (3) falling from stairs or steps.[3]

Falls will continue as a leading cause of injury until a comprehensive, multidisciplinary, epidemiologically-based prevention effort is established and maintained.

Fire and Burns

In 1996 in the United States, nearly 800 children aged 14 and under died because of fire and burn-related injury. During that same year, nearly 3,000 children aged 14 and under were treated in emergency rooms across the country for fireworks-related injuries.[8]

Nebraska hospitals treated 1,285 burn patients in 1996. The average length of stay was seven days and 1,033 total patient-days were spent in Nebraska hospitals due to fires and burns.[14] Nearly 2,500 Lancaster County residents received emergency room treatment for burn-related injuries during the 1992–95 four-year period.[3] Saint Elizabeth Regional Medical Center's Burn Registry documents 590 admissions to its Burn Unit during 1998. The average patient age was 31 years. The leading cause of burn unit admissions was contact with hot liquids and vapors.

Most fire and burn injuries are categorized as being caused by either "fire and flames" or "hot substance or

object, caustic or corrosive materials, and steam." Scald burn injury (caused by hot liquid or steam) is the most common type of burn-related injury among young children, while flame burns (caused by direct contact with fire) are more prevalent among older children.[8]

The number of Lancaster County burn victims aged four and under requiring emergency room treatment increased from 71 to 135 from 1992 to 1995.[3]

Suicide

In 1996 suicide was the ninth leading cause of death in the United States for all ages. Among adolescents and young adults (15–24 years of age) in 1997, suicide was the third leading cause of death.[1]

Over 25% of Lancaster youth surveyed for the 1997 Youth Risk Behavior Survey reported having seriously considered suicide within the previous 12 months. This percentage was above both the national (20.5%) and Nebraska (23%) figures. However, it does represent a decrease in the rate of youth considering suicide from 1995 (29.5%). The Lancaster County suicide death rate decreased slightly from 1995 (14.0%) to 1997 (12.4%).[15]

In 1998, there were 180 completed suicides in Nebraska, making suicide the state's ninth leading cause of death. The most common method of suicide in Nebraska was the use of firearms.[9]

Suicide prevention efforts typically focus on individuals who have attempted suicide and survived. This strategy tries to prevent further attempts and completion. In Lancaster County, community and school professionals are now attempting to identify high-risk individuals and intervene before suicidal thoughts become suicide attempts. An understanding of risk factors (which include being white, young, elderly, male, widowed or divorced, and/or socially isolated or having made a previous attempt or having recently experienced the loss of a loved one or employment) aid in the identification of high-risk individuals and in the early detection of potential suicides.[16]

Child Abuse and Neglect

Each day in the United States four children die from child abuse and 13,700 others are abused and neglected.[17]

Investigations by state child protection agencies in 48 states determined that 1,012,000 children were victims of child abuse and neglect in 1994. This figure represents a 27% increase from 1990, when approximately 800,000 children were found to be victims of maltreatment. During the five-year period from 1990 through 1994, the agencies reported that a total of 5,400 children died as a result of abuse or neglect.[18]

In 1997, 8,140 cases of child abuse and neglect were investigated in Nebraska, involving 4,054 children. Since 1985, the number of investigated cases of child abuse and neglect in Nebraska has increased 2.4%. A total of 1,519 Lancaster County child abuse and neglect cases were investigated in 1997. These cases involved 938 children.[18]

Several studies suggest that even more children suffer from abuse or neglect than are reported in the official statistics. The Third National Incidence Study of Child Abuse and Neglect (a study involving 5,700 community professionals who come into contact with children) estimates that almost 44 children per 1,000 in the population may have been victims of abuse or neglect.[19]

Progress has been made in identifying specific risk factors that may predispose an individual or family to child abuse. Families identified as at-risk for child abuse often share common indicators.[16] These indicators are the logical focus of prevention strategies:

- parent(s) who were abused in childhood or exposed to abnormal child-rearing practices
- drug and alcohol abuse
- mental disability
- mental illness
- financial or emotional stress
- parental expectations that are inconsistent with the stage of growth and development of a child
- no relief from the care of children for a parent or guardian.

Successful intervention strategies will require the combined efforts of educators, health care professionals, law enforcement officers, and legislative officials. Implementing a strategy to reduce the incidence of child abuse will require a substantial allocation of both human and financial resources throughout the community.

Health Disparities

Unintentional Injury

Unintentional injuries are the second leading cause of death for Native-American men and the third leading cause for Native-American women. More than 1,000 Native Americans die from injuries and 10,000 more are hospitalized for injuries each year. Among the factors that contribute to the high rates of death are rural or isolated living, minimal emergency medical services, and great distances to sophisticated trauma care.[1]

Minority children risk greater injury and less care (or more expensive care) than white children. Their families are more likely to lack health insurance; have more difficulty obtaining appropriate and necessary medical care; and have lower incomes, creating significant financial barriers to care. The children themselves are more likely to receive care in hospital emergency rooms, are less likely to receive life-saving preventive services, and practice fewer safety behaviors.[8]

Among children aged 14 and under, Native-American children have the highest unintentional injury death rate in the United States and are two times more likely to die from unintentional injury than white children. Factors that contribute to higher death and injury among Native-American children are more strongly associated with economic conditions than culturally-based differences in parenting.[8]

Black children aged 14 and under have the second highest unintentional injury death rate in the United States and are 1.7 times more likely to die from unintentional injury than White children. More than 45% of Black children are poor, which is approximately four times the poverty rate of White children. In addition, only 39% of Black children live with both parents.[8]

Native-American children aged 14 and under have a motor vehicle occupant death rate two times that of White children. Restraint use is lower in rural areas and low-income communities. Lack of access to affordable child safety seats contributes to a lower usage rate among low-income families. However, of the low-income families who own a child safety seat, 95% use it.[8]

Children aged ten and under are injured from falls at a rate of about twice that of the total population. Black children aged 14 and under have a fall-related death rate that is one and a half times higher than that of White children. Low-income children are more likely to be injured from falls due to improper supervision and deficiencies in the environment, including old and deteriorating housing.[8]

Black children are more than three times as likely and Native-American children are more than two times as likely as White children to die in a fire. Children aged four and under and children with disabilities are at the greatest risk of burn-related death and injury.[8] In 1998, 76.7% of all the admissions to the Saint Elizabeth Regional Medical Center's Burn Unit were male. Whites composed 88.8% of the those admitted to the Burn Unit, followed distantly by Hispanics at 6.5%.

Intentional Injury

In Lancaster County, the White population has a suicide death rate of 12.9% compared to the Black rate of 10.0%; Native-American, 9.7%; Asian, 9.6%; and Hispanic, 8.0%.[15]

Although Black youth had a lower suicide rate than have White youth, from 1986 to1995, the rate in 1986 for Black youths aged 10–19 years increased from 2.1 to 4.5 in 1995 per 100,000 population – a 114% increase. Suicidal behavior among all youths has increased in the United States from 1980–1995; however, rates for Black youths have increased more.[20]

The race of the majority of those people either arrested for or victimized by domestic violence is predominantly White. However, between 1997 and 1998 the proportion of those arrested and the victims who were White declined. In 1998, 77% of victims of domestic assault and protection-order violations were White, and 61% of the offenders were White. That compares to 79% of victims and 66% of offenders as White in 1997.[20]

Public Health Infrastructure

Although significant advances in the field of injury prevention have taken place during the 1990s, opportunities for protecting citizens from needless harm are even greater as we enter the twenty-first century. Health departments must be in a position to explore all possibilities of increasing the safety of those served.

New and enhanced safety technology, communication systems, education strategies, and data management tools are being developed and must be incorporated into state and local injury-control efforts. If the public health infrastructure cannot support integration of these resources, most likely communities will go without, resulting in greater risks of injury to their populations.

Recommendations

- Promote mandatory, comprehensive, community-based, injury prevention and personal safety programs.
- Support conflict-resolution training as a required class for all university education majors.
- Fund primary prevention programs that address the need for parents to raise healthy and safety-minded adolescents.
- Promote the adoption of a primary safety belt law.
- Increase capacity for enhancement of local injury data management (collection, analysis, and reporting).
- Develop a comprehensive, multidisciplinary strategy to address community, youth, and family violence.
- Increase public awareness of falls as a preventable injury and design a comprehensive education campaign addressing fall prevention.

- Expand and enhance existing unintentional and intentional injury prevention community networks, partnerships, and coalitions.
- Create more opportunities for youth recreation during after-school and weekend hours.
- Incorporate youth mediation and conflict resolution services into school, faith, work, and community activities.
- Provide training to medical professionals on fall prevention and balance for older adults.
- Enhance existing bicycle safety education programs by including rider safety courses and more strongly encouraging bicycle helmet use at community events.
- Encourage private/public collaborations to address environmental issues contributing to injury.

Notes

Related discussion or indicators are located in the chapters on *Healthy Children*, *Older Adults*, *Toxic and Hazardous Materials*, *Animal Control*, and *Alcohol and Other Drugs*.

Table 1

-- Currently no data source.

1. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. 1998 data from the Nebraska Office of Highway Safety.
3. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1996 data from the National Vital Statistics System.
4. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1996 data from the General Estimates System, National Highway Traffic Safety Administration.
5. Lincoln–Lancaster County Health Dept., 1992–95 data from the Injury Surveillance System, Emergency Room Records, Lincoln, NE.
6. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1995 data from the National Hospital Ambulatory Medical Care Survey (NHAMCS).
7. Nebraska Health and Human Services System, Data Management Services. 1997 data from the State of Nebraska E-Coded Hospital Data. Includes inpatient, outpatient, and ambulatory data.
8. Lincoln–Lancaster County Health Dept., Youth Risk Behavior Survey, 1997.
9. The Buffalo Beach Company, *The 1997 Youth Risk Behavior Survey: Summary Tables of Nebraska Data*, 1997.
10. Lincoln–Lancaster County Health Dept., *Vital Statistics*, 1998.
11. Nebraska Health and Human Services System, *Vital Statistics Report*, 1998.
12. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998. 1995 data from the National Vital Statistics System.
13. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, Sept. 1998. 1995 data from the National Youth Risk Behavior Survey.
14. Nebraska Health and Human Services System, Department of Regulation and Licensure, 1997 data from the Protection and Safety Division.

Tables 2–4

1. Lancaster County Injury Surveillance Database (Emergency Room Visits), 1994–95.
2. Lancaster County Acute Inpatient Hospital Discharge Data, 1995–96.
3. Lancaster County Vital Statistics, 1995–96.

Narrative sources

1. U.S. Dept. of Health and Human Services, Office of Public Health and Science, *Healthy People 2010 Objectives: Draft for Public Comment*, September 1998.
2. Institute of Medicine, *Reducing the Burden of Injury*, Washington, D.C., 1999.
3. LLCHD, Unpublished E-Code Medical Record Data, 1995.
4. Lincoln/Lancaster County, Nebraska. Family Violence Council, *Report on Domestic Violence for 1998*.

5. Nebraska Office of Highway Safety, *Motor Vehicle Data Summary*, 1999.
6. National Safety Council, *Defensive Driving Course Instructor Manual* (1998)
7. Madonna Rehabilitation Hospital Web Page.
8. National SAFE KIDS Campaign Injury Fact Sheet, 1998.
9. Nebraska Health and Human Services System, Division of Health Data Systems, *Vital Statistics Report*, 1998.
10. The National Committee for Injury Prevention and Control, U.S. Department of Health and Human Services,"Injury Prevention: Meeting the Challenge," supplement to the *American Journal of Preventive Medicine* 5, no. 3, 1989.
11. Lincoln–Lancaster County Health Department, *Healthy People 2000*, 1990.
12. National Committee to Prevent Child Abuse. Statistics Related to Children in our Society Fact Sheet, 1998.
13. Study of National Incidence of Child Abuse and Neglect, 1986.
14. Nebraska Health and Human Services System, *Nebraska Injury Report*, 1996 Hospital Discharge Data, 1999.
15. Lancaster County 1997 Vital Statistics Report.
16 Pacer Center, Inc., *Let's Prevent Abuse: An Information Guide for Educators*, 1989.
17. Children's Defense Fund.
18. U.S. Department of Health and Human Services, HHS Fact Sheet, "Preliminary Findings Regarding Child Abuse and Neglect," December 1995.
19. Nebraska Department of Health and Human Services, *Child Abuse and Neglect Investigations Statistics – State Summary*, 1998.
20. Morbidity and Mortality Weekly Report. vol. 47, no. 10. March 20, 1998.

Authors and Community Contributors

Individuals who provided direction and feedback to the overall Healthy People 2010 process:

Lincoln–Lancaster County Board of Health: Rodrigo Cantarero, Chris Caudill, Mary Helen Elliott, James Ganser, Larry Hudkins, James Hulse, Cindy Johnson, Betsy Palmer, Ann Seacrest

Healthy People 2010 Community Steering Committee: Michael Alesio, McKensie Barry, Greg Barth, Ann Bleed, Stacie Bleicher, Kit Boesch, William Bonacker, John Bradley, Rodrigo Cantarero, Molvina Carter, Chris Caudill, Christi Chaves, Vicki Duey, Gina Dunning, Mary Helen Elliott, Richard Erixson, Mark Essman, Richard Evnen, Deane Finnegan, Timothy Fischer, Ken Foster, Chad Foust, Joe Francis, Joel Gajardo, James Ganser, Steve Gaul, Renee Geller, Christina Godfrey, Dennis Grams, James Griesen, Dale Gruntorad, Carrie Hakenkap, Marsha Halpern, George Hanigan, Mary Harding, Teresa Harms, Mary Lynn Harms, Oscar Harriott, John Hetcko, Larry Hudkins, James Hulse, Kip Hulvershorn, Cindy Johnson, Glen Johnson, John Kopetzky, Sara Kramer, Robert Kuzelka, Robert Lanik, Bill Latenser, Richard Lewis, Charlotte Liggett, Steve Masters, Glory Meakin, Robert Moyer, Dan Navratil, Patte Newman, Ian Newman, Jung Nguyen, Rene Ojeda, Jr., Natalie Clark Olsen, Betsy Palmer, Michelle Petersen, Richard Peterson, Karen Phillips, Adi Pour, John Roberts, Randy Ross, David Sands, Phil Schoo, Greg Schwinn, Ann Seacrest, Susan Seacrest, Lori Seibel, Coleen Seng, Deb Shoemaker, Clay Smith, Leslie Spry, Linda Steinman, Arlan Stromberg, Ken Svoboda, Michael Tavlin, Bill Thurmond, Maria Vu, Don Wesely, R. Lynn Wilson, Dale Young

Health Disparities Advisory Group: Olga Caicedo, Suriah Camelian, Rita Chen-Brown, Brenda Christie, Kenee Fox, Renee Geller, Alix Gomez, Romeo Guerra, Oscar Harriott, Dora Herrera, Osceola Howard, Roscoe Howard, Marilyn James, Mary Lee Johns, Eric Lee, Rodney Moore, Diane Myers, Jung Nguyen, Ephraim A. Pembleton, Yvonne Powers, Sr. Rosaria Hoang, Randy Ross, Angela Singh, Janelle Soderling, Kathi Taylor, Keith Taylor, Tuyet Anh Tran, Nicky Turner, Maria Vu

Health Disparities Focus Group Participants

Asian Center (Immaculate Heart of Mary Church): Bach, Nhoung Dinh, Hai, Sr. Rosaria Hoang, Tai Van Hoang, Loc Le, Phat Luu, Buoi T. Nguyen, Diem Thi Nguyen, Hay Thi Nguyen, Lam Nguyen, Nu Nguyen, Thang V. Nguyen, Truong Nguyen, Vang Nguyen, Thanh Pham, Mai Phan, Quyet, Hoa Tran, Anh Ngoc Thi Vo

Hispanic Center: Carmen Arizaga, Sr. Adriana Bendle, Graciela Castillo, Martha E. Chiptes, Estela Servin Cruz, Juanita Espinoza, Alix Gomez, Maria Anita Gonzalez, Dolores Guevara, Mabel Gomez Hernandez, Maria E. Hernandez, Alicia Hettenbaugh, Ramana Lameli, Maria Martinez, Sr. Gloria Moreno, Maria Razo Ortiz, Jose S. Reyes, Nelia Reyes, Alma Delia Serrano R., Lisa Yanike

Malone Center: Molvina Carter, Doris Collins, Christina Godfrey, Esther Hoard, Denise Hooks-Anderson, Osceola Howard, Kimberly Jones, Rebecca Joppett, Roger Lynheart, Lawrence R. Myers, Dionne Parks, Keri Schell, Jim Stegeman, Nicole Washington, Sabrina Weaver

Indian Center: Joan Amen, Rebecca Amen, Sara Anderson, Joseph C. Bad Moccasin, Dani Bertucci, Ken Bordeaux, Alberta Canby, Myra A. Goode, Janice Grant, Rebecca Habagat, Marilyn James, Renee Lacota, Sonja Laramie, Brenda Landaverde, Helen Long Soldier, Joseph Moose, Joe Pappan, Gloria Patton, Owen Patton, Carol Phillips, Travis Phillips, Wathina Porter, Orval Poor Bear, Carla A. Renteria, Betsy A. Sifuentz, Misty Thomas, Sherita Two Strike, Chris Vance

People with Disabilities – Madonna Support Group: Lisa Ahmann, Ben Bashor, Norman Day, Jr., Susan Fager, Shirley J. Foster, Travis Groft, Teresa Harms, Bruce Hromek, Doris Lewis, Diana Lingren, Mike Lockhart, Bob Miller, Mitch Miller, Pat Morton (for Dan Steinbeck), Rick Patocka, Kipp Ransom, Taite VanDeventer, Lois VanDeventer, Roger VanDeventer, Juanita Wigley, Perry Wigley, Victor Witkowicz, Debora Dukes, Josie Johnson

Individuals who provided direction and feedback for each chapter of the Healthy People 2010 document:

Health Disparities

Primary author: Kathy Cook

Community contributors: Health Disparities Advisory Group, Health Disparities Focus Group Participants (see above)

LLCHD staff: Brenda Christie, Jean Krecji, Alicia Hettenbaugh, Osceola Howard, Marilyn James, Ana Pelayo, Gwendy Meginnis, Diane Myers, John Steinauer, Tuyet Anh Tran, Nicky Turner, Tammy Weihe

Maternal and Child Health

Primary authors: Judy Halstead, Melissa Oerman

Community contributors: Greg Barth, Stacie Bleicher, Joanne Bronson, Rita Chen-Brown, Vicky Duey, Sheila Eckland, Ken Foster, Renee Geller, Sr. Rosaria Hoang, Mary Lee Johns, Kay Kiechel-White, Sean Kenney, Sara Kramer, Jan Madsen, Rodney Moore, Jung Nguyen, Bob Peters, Yvonne Powers, Adi Pour, Randy Ross, Ann Seacrest, Kathi Taylor, Maria Vu; Groups: Lincoln Early Intervention Planning Region Team

LLCHD staff: Carole Douglas, Osceola Howard, Leslie Krump, Carol Kukuk, Marilyn James, Barb Martinez, Claudia Pankoke, Tuyet Anh Tran

Healthy Children

Primary authors: Patty Baker, Steve Beal, Don Siffring, Jane Storey

Community contributors: Jeanelle Andersen, Linda Anderson, Fran Baatz, Deborah Badeer, Lorene Bartos, Stacie Bleicher, Linda Douglas, Caroline Edwards, Tom Fortune, Carol Greenwald, Russel Hopp, Kathy Karsting, Russsel Koos, Sara Kramer, Teresa Harms, Sue Hinrichs, Carol Iverson, Dr. Martin, Liz McCoy, Lora Miles, Dan Navratil, Barbara Ogg, Betsy Palmer, Mary Peterson, Lynn Murray Smith, Nicole Sweigard, Linda Thomsen, Pat Urzedowski, Stephanie Volk, Pamela Windhorst

LLCHD staff: Marge Determan, Judy Halstead, Pat Lopez, Carol Mitchell, Sue Ann Tabatabai

Older Adults

Primary author: Peggy Apthorpe

Community contributors: Dee Aguilar, Nancy Barrett, Kelle Brandt, Pam Carstens-Zweibel, David Chapelle, Roxana Copp, Jan Ekeler, Bob Esquivel, Joanne Farrell, Patt Harper, Marilyn Henry, Jean Holt, Tim Howell, Joyce Kubicek, Kathy Kuehn, Pam Lander, Barbara McCabe, Sally McGinty, Chet McPherson, Rebecca Meyer, Donna Mulder, Sandy Oswald, Deb Peck, Delayne Peck, Judy Pfeifer, Elaine Pike, Mary Reed, Audrey Roesler, Diane Rolfsmeyer, Reba Schafer, Jodene Schwindt, Marjorie Sommer, Barb Straus, Sandy Strickland, Faye Swanson, Kris Thaller, Gerry Thompkin, Donna Washburn, Richard Westling

Chronic Disease

Primary author: Charlotte Burke

Community contributors: Greg Barth, Kelly Bauer, Chris Caudill, Vicki Duey, Ken Foster, Barbara Fraser, Mary Jo Gillespie, Kathy Goddard, Jay Goodman, Debra Harding, Teresa Harms, Mary Lee Johns, Dayna Krannawitter, Mitzi Klimek, Charlotte Liggett, Elli Nyberg, Bob Peters, Leslie Spry, Ruth Van Gerpin, Stephanie Volk, Megan Waltz-Hill

LLCHD staff: Lisa Henning, Julia Tracy

Oral Health

Primary author: Gwendy Meginnis

Community contributors: Nina Beck, Darrell Brown, Rick Brunmeier, Brett Cascini, Bruce Condello, Michelle Ellis, James Ganser, Louis Hedlund, Julie Marshall, Kim McFarland, Michael Molvar, Darlene Mundt, Robert Schoettger, Sue Wisner

Access to Health Care

Primary authors: Pat Lopez, Julia Tracy

Community contributors: Mary Caudy, Vicki Duey, Mary Helen Elliott, James Ganser, Renee Geller, Teresa Harms, Lynn Holz, Deb Hoover, Paul Jensen, Mary Lee Johns, Glen Lau, Natalie Clark Olson, George Osborne, Betsy Palmer, Betty Semm, Leslie Spry, Carol Steffan, Joe Sticher, Maria Vu, Ed Wimes; Groups: Lincoln Internal Medicine, Lincoln

OB-GYN PC, North Lincoln Family Medical Center, Pediatric & Adolescent Medicine, Star City Medical Clinic PC

LLCHD staff: Carole Douglas, Barb Martinez, Gwendy Meginnis

Safe Food

Primary author: Joyce Jensen

Community contributors: Michael Alesio, John Coffey, Carolyn Cook, Fayrene Hamouz, George Hanssen, Mary Lynn Harms, Sandy Hayward, Alice Henneman, Art Jimenez, Doris Johnson, Kay Lamphear, Mark Lutz, R. Burt Maxcy, Billene Nemec, Dean Rasmussen, Ken Semler, Kathy Siefken, Thomas Taylor, Jan Wadell

LLCHD staff: James Bare, Justin Daniel, Paul Drotzmann, Janet English, Gail Johnson, Leon Marquart, John Miner, Doug Smith

Water Management

Primary author: John Miner

Community contributors: Corey Brubaker, Jack Daniel, Chad Foust, Steve Gaul, Bruce Hansen, Lynn Heng, Rachael Herpel, Steve Masters, Nick McElvain, John Miriovsky, Ron Preston, Greg Schwinn, Steve Sulek, Paul Zillig

LLCHD staff: James Bare, John Chess, Justin Daniel, Paul Drotzmann, Jerrold Hood, Ron Marquart

Clean Outdoor Air

Primary author: Marcia Willhite

Community contributors: Rick Albro, Joe Francis, John Hetcko, Kip Hulvershorn, Harry Niederhaus, Karen Phillips, Judy Roots, Tom Wicken, Wayne Woldt, Bob Workman

LLCHD staff: Scott Holmes, Gary Walsh

Clean Indoor Air

Primary author: Marcia Willhite

Community contributors: Joe Francis, John Hetcko

LLCHD staff: Scott Holmes, Mike Holmquist, Chris Schroeder

Toxic and Hazardous Materials

Primary author: Bill Pugsley

Community contributors: Gary Brandt, Lyle Christensen, Joe Francis, Gene Hanlon, John Hetcko, Steve Masters, Steve Owen, Ralph Pflasterer, Gerardo Talero, Karla Welding

LLCHD staff: Nancy Clark, Ron Eriksen, Beth Mann, Richard Slama, John Steinauer

Public Health Emergency Management

Primary author: Bill Pugsley

Community contributors: Douglas Ahlberg, Joe Francis, John Hetcko; Regional EPA: William Finan, Mark Smith, Herbert Zirski

LLCHD staff: Nancy Clark, Ron Eriksen, Beth Mann, Richard Slama, John Steinauer

Waste Management

Primary author: Joyce Jensen

Community contributors: Gary Brandt, Susan Budler, Jay Carter, Lyle Christensen, Gene Hanlon, Steve Harms, Ryan Hatten, Steve Hatten, Chris Huenink, Mark Johns, Sherry Johnson, Dale Kurtzer, Dan Kurtzer, Gary Kurtzer, Greg Kurtzer, Steve Masters, Steve Owen, Mike Palmer, Mark Sullivan, Gerardo Talero, Mark Umberger, Ken Weber, Dan Zajicek, Dennis Zajicek

LLCHD staff: James Bare, John Chess, Paul Drotzmann, Harry Heafer, Scott Holmes, Jerrold Hood, Leon Marquart, Ron Marquart

Animal Control

Primary author: James Weverka

Community contributors: Deborah Borner, Jackson Chandler, Mark Clinton, Dave Cygan, Bob Downey, Pat Eiche, Gary Foster, Brad Gengenbach, Joyce Greenfield, Ruthann Macolini, Deborah Reinhardt, Florafae Schoen, Kelli Stanley Smith, Wilma White, Liza Zentz-Zager

LLCHD staff: Kurt Dodd, Lori Dorsey, Diane Hoy, Jason Kelly, Tim Miller, Trent Smith, DeMon Wimes

Tobacco Use

Primary author: Charlotte Burke

Community contributors: Chris Caudill, Tim Grollmes, Judy Martin, Elli Nyberg, Ann Seacrest, Leslie Spry, Cindy Wostrel

LLCHD staff: Lynn Jones, Melissa Oerman

Nutrition and Physical Activity

Primary author: Charlotte Burke

Community contributors: Barbara Fraser, Kathy Goddard, Debra Harding, Charlotte Liggett, Megan Waltz-Hill

LLCHD staff: Patty Baker, Lisa Henning

Alcohol and Other Drugs

Primary authors: Jamie Hahn, Linda Major, Patte Newman

Community contributors: Jim Baird, Manny Bartek, Greg Barth, Ken Foster, Joel Gajardo, Dave Harnly, Dave Humm, Steve McElravy, Dennis Miller, Sandy Morrissey, Bob Peters, Sim Reynolds, Jeff Soukup, Sara Walters, Nancy Wolf, Fred Zwonechek

Sexual Behavior

Primary author: Tim Timmons

Community contributors: Betsy Palmer, Kit Boesch

LLCHD staff: Brenda Christie, Carole Douglas, Tom Marx

Immunization and Communicable Disease

Primary author: Tim Timmons

Community contributors: Stacie Bleicher, Charlotte Liggett

LLCHD staff: Sally Cameron, Brenda Christie, Carole Douglas, Scott Rosecrans, Bev Teche

Unintentional and Intentional Injury

Primary author: Brian Baker

Community contributors: Kit Boesch, Barb Dewey, Teresa Harms, Bob Moyer, Steve Masters

LLCHD staff: Steve Beal, Don Siffring

Lincoln–Lancaster County Health Department Staff who assisted:

Leon Vinci, Health Director, Bernice Afuh, Jeff Armitage, Roxey Babcock, Brian Baker, Patty Baker, James Bare, Steve Beal, Trudy Bennett, Charlotte Burke, Sally Cameron, John Chess, Brenda Christie, Nancy Clark, Kathy Cook, Justin Daniel, Marge Determan, Kurt Dodd, Lori Dorsey, Carole Douglas, Paul Drotzmann, Joyce Endres, Janet English, Ron Eriksen, Richard Faubel, Karla Gyenes, Jamie Hahn, Carolyn Hall, Judy Halstead, Harry Heafer, Lisa Henning, Gloria Hernandez, Alicia Hettenbaugh, Scott Holmes, Mike Holmquist, Jerrold Hood, Osceola Howard, Diane Hoy, Marcia Huenink, Marilyn James, Lynn Jones, Karen Kerl, Carl Kinkade, Jean Krejci, Leslie Krump, Carol Kukuk, Joyce Jensen, Gail Johnson, Pat Lopez, Beth Mann, Leon Marquart, Ron Marquart, Barb Martinez, Tom Marx, Gwendy Meginnis, Tim Miller, John Miner, Carol Mitchell, Wayne Mollhoff, Diane Myers, Patte Newman, Melissa Oerman, Claudia Pankoke, Ana Pelayo, Cindy Peters, Bill Pugsley, Nathan Putens, Cher Reynolds, Tracy Rollins, Scott Rosecrans, Chris Schroeder, Elaine Severe, Don Siffring, Richard Slama, Doug Smith, Trent Smith, John Steinauer, Catherine Steinweis, Jane Storey, Sue Ann Tabatabai, Bev Teche, Tim Timmons, Julia Tracy, Tuyet Anh Tran, Nicky Turner, Carlene Waldron, Gary Walsh, Tammy Weihe, James Weverka, Marcia Willhite, DeMon Wimes, Brenda Wolfe

Indicators

Development of indicators and data sources was directed by: Catherine Steinweis, Kathy Cook, Jamie Hahn, and Jeff Armitage

Special thanks to

Mark Miller and Dan Harrah, Nebraska Department of Health and Human Services for providing state data; Tom Fortune and the Lincoln Early Intervention Planning Region Team for help funding the focus group effort in the minority community.